THE

AMERICAN GAS-LIGHT JOURNAL

DEVOTED TO

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Iron Buildings, Nos. 254 & 256 Canal Street, East, near Broadway, New York.

VOL. II.—No. 18. NEW-YORK, SATURDAY, SEPTEMBER 15, 1860. $3 PER ANNUM.

TO GAS-FITTERS & PLUMBERS.—L. Waefeler & Co., No. 94 Beekman street, New York, have always on hand several hundred kegs WROUGHT-IRON GAS-PIPE HOOKS, of all sizes from ¼ to 2 inches. They are made of best quality horse-shoe nail iron, and warranted not to break. Also, PLUMBERS' MATERIALS, such as China Wash-Basins, Closet-Basins, Pan-Closets, Bath Tubs, Boilers, Brass and Silve-plated Cocks, Brass and Iron Pumps, Hydraulic Rams, French Fountain Jets, &c., all at the very lowest prices.

BUTTS & KENDALL, (Formerly F. Butts & Co.,) Dealers in STERLING COAL, Cleveland, Ohio.—The attention of Gas Companies is called to the following letters as to the merits of the above Coal, being a few of the many we have received, and from which we are led to believe that there is no English or American Coal which combines all the qualities desired in a Gas Coal as perfectly as the Sterling :—

Office of the Manhattan Gas Light Co.,
New York, January 13, 1860.

MESSRS. BUTTS & KENDALL :—*Gentlemen* :—Yours 9th inst. is received. The "Sterling Coal" received from you during the past year worked very satisfactorily—averaging 9520 cubic feet of 15 candle Gas per ton of 2240 lbs, and 41 bushels of Coke, weighing 1465 lbs. We consider it among the best of American Gas Coals, for the quantity and quality of the Gas produced, and also for the excellent quality of its Coke. I am, Gentlemen, your obedient servant, CHARLES ROOME, Pres.

Office of the Rondout and Kingston
Gas Light Co., Rondout, *Jan.* 4, 1860.

MESSRS. BUTTS & KENDALL :—*Gentlemen* :—The 600 tons of Sterling Coal ordered from you in August, 1859, has now been in use over four months, to my entire satisfaction. Its average yield is 4, 40-100 feet, and a good strong light. The Coke produced equal in quality and quantity, to best English Coking Coals. It burns very freely with little clinker. In purification it is economical, using no more lime than New Pelton. It is superior to any American Coal I ever used. I shall be pleased to give you any further information at my office in New York.

WM. W. HAGUE, 522 Broadway.

The Cleveland Gas Light and Coke Co.,
Office, 195 *Superior-St., Cleveland, Dec.* 30, 1859.

MESSRS. BUTTS & KENDALL :—*Gentlemen* :—This Company has used between 3000 and 4000 tons of your "Sterling Coal," and are still using it with very satisfactory results. We find the average product of a ton of 2000 lbs. is about 8800 feet of Gas and about 37 bushels of Coke. The Gas is of good illuminating power and quite free from sulphur or other impurities, one bushel of lime purifying 9000 feet, and the Coke of very superior quality. The yield of Gas is about the same as from the Pittsburgh Coal, and the Coke better adapted to our use. Yours, truly, T. DWIGHT EELLS, Sec.

Office of the Sandusky, O., Gas Co., *Jan.* 16, 1860

MESSRS. BUTTS & KENDALL:—*Gentlemen* :—This Company has used your Sterling Coal since (July 3d, 1859, and are still continuing the use of it with satisfaction to the Company and consumers. The average product has been 8,629 feet of Gas per ton of 2,000 lbs, and 37 bushels of Coke of very superior quality. The Gas is as good as that obtained from Pittsburgh Coal. I consider it the best Coal ever used in our works. I am, gentlemen, yours respectfully, WM. HUDSON, Sup't & Sec'y.

We would also refer to Gas Companies in the following places :—New York City (Manhattan and New York Co's), Albany, Troy, West Troy, Rochester, Oswego, Rondout, Kingston, Albion, Brockport, Seneca Falls, Elmira and Lyons, in the State of New York ; Cleveland, Toledo, Sandusky, Norwalk and Oberlin, in Ohio ; Detroit, Ann Arbor, Grand Rapids and Kalamazoo, in Michigan ; Coburg, in Canada, and two Companies in Milwaukie, Wisconsin.

The extensive Mines of the Sterling Coal and Mining Company, in the western part of Pennsylvania (known as the Sterling Hills, and the highest in that part of the State), are wholly under our control, and the Coal is mined and sold only by us or our Agents. The average product of the Sterling Coal, per ton of 2,000 lbs., is 8,733 feet of 15¼ candle Gas (4, 37-100 per lb.), and 37 bushels of Coke of very superior quality. Getting our Coal to this place by railroad, a supply can be had during the summer months (as well as at all other times), which is not the case with coals dependent upon high water for transportation, as are most or all other gas coals which are sent to the Lake ports for shipment. Our mining facilities are such, that we are prepared to ship extensively. For any further information address the undersigned, or M. BALLARD, Esq., Syracuse, N. Y., who is our Agent for that State.

BUTTS & KENDALL, Cleveland, O.

CORNELIUS & BAKER,

MANUFACTURERS OF

Lamps, Chandeliers, Gas-Fixtures, &c.,

MANUFACTORIES,

821 Cherry-St., and Fifth-St. and Columbia Avenue.

STORE, 710 CHESTNUT STREET,

PHILADELPHIA.

JOHN HEARN & CO., Dealers and Miners in AMERICAN GAS-COALS, Erie, Penn., would call the attention of Gas Companies to the superior quality of our Coals. For the past ten years they have been used by a majority of the Gas Companies in the State of New York, west of Albany and Troy. And also by the Gas Companies in the cities and towns of the North-Western States, and, during the past year, by the East Troy Gas-Light Company, Albany Gas-Light Co., and Manhattan Gas-Light Co. of the city of New-York, —all of which heretofore used English Coals.

Owning our mines and a fleet of vessels on the Lakes, having no Railroad transportation, and only 70 miles of canal from this city, or 140 miles of canal and Lake from Buffalo to the coal fields, being 175 miles less of transportation for Coal to the Seaboard, than any Coal Depot on the Lakes and having an Agency in Buffalo for the transhipment of our Coals only, it is unnecessary to say that parties purchasing of us, will get their Coal at first hand, saving, thereby, commission to managers and 175 miles of extra railroad and lake transportation.

A working average of our Beaver Coal is 9,500 feet of 16 Candle Gas, and 40 bushels Coal to the ton of 2,240 lbs.

The Manhattan Gas-Light Co of New York having thoroughly tested the Gas Coals of Pennsylvania and Ohio, the following extract from a letter to us will speak for itself:

"MANHATTAN GAS-LIGHT COMPANY,
"New York, June 15th, 1859.

"Messrs. JOHN HEARN & Co., Erie, Penn. :

"GENTLEMEN,—This Company has a contract with your firm for the delivery of five thousand tons of Gas Coal, half each Beaver and Mount Carbon, at $ —— per ton of 2,240 lbs.

"The cargo which has been received is satisfactory, and as we shall need 15 or 20 thousand tons more, to be delivered through the present summer, we beg you to advise us whether you desire to increase your contract. We have applications from various parties who desire to supply the Company, but shall be satisfied to get a larger quantity of your Coals, provided you can serve us on terms equally favorable with others.

"For the Gas Co.,
"HENRY YOUNG."

We are prepared to contract for the delivery of our Coals in the City of New York, or the cities and towns on the Hudson River.

CANNEL AND ORREL GAS-Coal.—The Subscribers are constantly receiving direct, from the celebrated mines of WILLIAM H. BRANKER & CO., NEWCASTLE, ENG., COAL of the very first quality for gas purposes, which they will sell direct from ship or from yard at the lowest market price ; and we guarantee the coal to be equal if not superior to any other coal brought to this market.

CORNELIUS BAKER & SON,
61 Leonard st. and 652 Hudson st., New York.

GAS-CANNEL COAL,
AND
APPARATUS,
SUPPLIED BY
EMANUEL TURNER & CO.,
Export Offices, 34 Castle-st., Liverpool.
See Advertisements in Vol. 1, of AMERICAN GAS-LIGHT JOURNAL.

HORATIO EAGLE, Rooms of the AMERICAN GAS-LIGHT JOURNAL, Nos. 254 and 256 Canal-st., near Broadway, New York.

Manufacturers' Agent for the sale of all descriptions of APPARATUS, PHILOSOPHICAL INSTRUMENTS and Raw Material used in and about Gas and Coal-Oil Works.

Also, Dealer in KEROSENE and other approved brands of COAL-OILS, Candles, etc., etc.

Estimates procured for VILLAGE and PORTABLE GAS-WORKS of all kinds, COMPRESSED GAS APPARATUS, &c., &c.

TO INVENTORS.—Patent Agency of the AMERICAN GAS-LIGHT JOURNAL.—The Proprietor of the AMERICAN GAS-LIGHT JOURNAL, is happy to announce that a

PATENT DEPARTMENT

Is now connected with these ROOMS, under the charge of

MR. F. C. TREADWELL, JR.,

Well known as one of the most prompt, reliable, and able Patent Agents and Experts in the United States.

Patents taken out in this Country, and in GREAT BRITAIN, FRANCE, BELGIUM, and All other Countries where Patent Laws are in force.

Re-Issues, Rejected Applications, Interference Cases, attended to with the utmost personal care, and with Mr. TREADWELL'S long experience, the interests of Patentees will be unsually secure.

Inventors are cordially invited to visit the ROOMS of the AMERICAN GAS-LIGHT JOURNAL, Iron Buildings, Nos. 254 and 256 Canal street, East, near Broadway, New York.

INVENTORS' DEPOT & SALES Room for Patent Rights.—Parties desiring to dispose with us valuable Patents, for the sale of Rights, on commission, will here find the Head-Quarters for Inventors and their Patents, as well as for parties seeking investments in articles of undoubted merit. The public are invited to call, or send for circulars. New articles coming in daily. BUTLER, HOSFORD & CO.,
No. 30 Broadway, N. Y., Proprietors of the Paragon Self-Generating Gas-Light.

TO GAS COMPANIES AND CON-tractors.—For Sale : Two sets Dry Lime Purifiers, 14 feet by 12 feet, 5 tiers of plates, 12 inch connections ; and One Set Purifiers, 10 feet by 5 feet, 5 tiers of plates, 8 inch connections. A Station Meter, (square case) 8 feet front, 8 feet deep, and 7 feet high ; register s 250,000 feet per diem. Also a quantity of Bench Castings, consisting of sections of Hydraulic main, (D shaped pattern,) Stand, Bridge and Dip Pipes, together with a number of Composition-faced Slide Valves, various sizes, from 6 inches to 16 inches diameter. Address the ENGINEER OF THE MANHATTAN GAS-LIGHT COMPANY, Foot of 18th-st., N. R., New-York.

EXTENSIVE WATER POWER for Sale. The proprietors of the White River Falls Corporation now offer for sale their property, situated on the Connecticut river, about one mile north of the White river junction, and comprising the upper and lower falls and lands adjoining. The extent of this water power, its location at the intersection of the Northern, Vermont Central, and Connecticut and Passumpsic river railroads, and the opportunity to purchase adjoining lands at very moderate prices, furnish facilities for building up an extensive manufacturing town not surpassed in New England. The above property will be offered for sale at public auction at the Dartmouth Hotel, in Hanover, N. H., on Tuesday the 25th day of September next, at 3 o'clock P. M., if not previously sold at private sale. Terms of sale made known at time of sale For further information reference is made to Andrew T. Hall, Esq., or Dr. Jabez B. Upham, Boston, or the subscriber, at Hanover, N. H.

DANIEL BLAIRDEE, Clerk of W. R. Falls Co.
HANOVER, N, H., July 17, 1860.

JAMES RENWICK SMEDBERG, Consulting and Constructing GAS-ENGINEER. SAVANNAH, GEO.

REFERENCES :

CHARLES ROOME, Esq., Pres. Man. Gas Co., N. Y.
J. K. BRICK, Esq., Eng'r. Brooklyn Gas Co., "
Messrs. ELLIMAN BROTHERS, New-York.
F. T. WILLIS, Esq., Pres. Savannah Gas Co.
J. A. SABBATON, Esq., Eng'r. Man. Gas Co., N. Y.
JOHN B. MURRAY, Prop. AM. GAS-LIGHT. JOUR.

E. V. HAUGHWOUT & CO.,
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Gas-Fitters & Contractors for the Erection of Gas-Works.

Messrs. E. V. HAUGHWOUT & Co. have on hand most extensive assortment of the newest and most desirable styles of
CHANDELIERS, BRACKETS, LAMP-POSTS, AND GAS-FIXTURES OF EVERY DESCRIPTION,
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☞ Gas-fitting done in the most workmanlike manner, and on reasonable terms.

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In addition to their large stock of rich Goods, offer for sale a large assortment of CHANDELIERS and GAS FIXTURES, of every description, and of the newest styles, both Foreign and Domestic manufacture.

PARIS'S PATENT Glass-Enamelled Wrought-Iron Tubes.
PROSSER'S PATENT
LAP-WELDED IRON BOILER TUBES.

TUBES FOR ARTESIAN WELLS, CONVEYING STEAM OR WATER, SHAFTING, &C., SCREWED OR COUPLED TOGETHER, IN VARIOUS WAYS.

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Catalogues remitted to any address on receipt of six cents in P. O. stamps.

GAS ENGINEERS' LIBRARY.—The following works, indispensable to Engineers, Contractors and others engaged in the construction of Gas Works and manufacture of Gas, have been selected out of a large stock of chemical and other works, and are recommended to the attention of those interested.

AMERICAN GAS-LIGHT JOURNAL, Vol. 1, bound $5
Do. do., in numbers, per annum, $3
ANTISELL on Photogenic or Hydro-carbon Oils. 1 vol. 4to. $1.75
BOOTH. Encyclopædia of Chemistry. 1 vol. 4to, $10
BUNSEN. Gasometry. 1 vol. 8vo. $2.50.
Chemistry applied to the Arts and Manufactures. By KNAPP, RONALDS & RICHARDSON. Fuel and its Applications ; Coal, Gas, Oil, Spermaceti, &c., and their application to purposes of Illumination, Lighthouses, &c. 433 Engravings and Plates. Vol. 1, in two parts. $9.00.
CLEGG, (S.) Manufacture of Coal Gas. 3d ed., with plates. London, 1 vol. 4to. $10.00.
FARADAY, (M.) Chemical Manipulations. London, 1827. Very scarce. 1 vol. 8vo.
GRAHAM. Elements of Chemistry. 2d ed. $3.
HUGHES. Treatise on Gas Works. 1 vol. 8vo. $1.25
JOURNAL FUR GASBELEUCHTUNG, Munich, per annum, $4.50
JOURNAL OF GAS-LIGHTING, London, per annum, $6
KYAN. Elements of Light. 1 vol. 8vo. $1.
LE GAZ, Paris, per annum, $3.50.
LE JOURNAL DE L'ECLAIRAGE AU GAZ, Paris, per annum, $3.50.
MILLER, (W. A.) Elements of Chemistry, Theoretical and Practical, extensively illustrated. 3 vols. 8vo. London. $15
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PARNELL. Applied Chemistry in Manufactures. 2 vols. 8vo. $7.50.
PECKSTONE. Manufacture of Coal-Gas. 1 vol. $7.50
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URE. Dictionary of Arts, Manufactures, and Sciences. 4th ed. London. 2 vols. 8vo. $5.50.
WILLIAMS. Treatise on the Combustion of Coal. 1 vol. 4to. London. $3.75.

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ROOMS OF THE AMERICAN GAS-LIGHT JOURNAL,
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38 BURLING SLIP, NEW YORK, DEALERS IN
ROSINS ADAPTED ESPECIALLY TO GASMAKERS' USE.
N. B.—J. H. B. & CO. ARE CONSTANTLY PURCHASERS OF ROSIN-GAS TAR.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE, ENGLAND,
Manufacturer of CLAY RETORTS, FIRE BRICKS, and every description of FIRE CLAY GOODS.

TO GAS-COMPANIES, ENGINEERS, Merchants, Gas-Fitters, Surgical Instrument Makers, &c.

FLEXIBLE GAS FITTINGS.

The existing great demand for Hancock's ENAMELLED or GLAZED FLEXIBLE TUBING, and the increased facilities of manufacturing it, is an assurance of the satisfaction experienced by the public in the use of this article, so extensively made by JAMES LYNE HANCOCK, OF LONDON, who begs now to announce to the trade, that he continues to export, to a large extent, FLEXIBLE GLAZED TUBING for GAS, Surgical and other instruments, now in such general use amongst Gas Companies, Engineers, Gas-fitters and others.

This is the only TUBING that perfectly resists the action of coal gas. It is made of all sizes, from ⅛ inch up to 1½ inches, and in 60 feet lengths. The measure is always external diameter, to connect the usual metal fittings.

SOLID VULCANIZED INDIA RUBBER TUBING, for GAS, WATER, &c., made of all sizes, and in 60 feet lengths, either with or without spiral wire inside.

For price lists and any other information, apply to JAMES LYNE HANCOCK, VULCANIZED India Rubber Works, 8 Goswell Road (opposite Spencer street), LONDON, E. C.

N. B.—Orders by post, with remittance, or good reference in England, will be promptly executed.

WILLIAM RYDER,
General Mineral and Metal Agent and Merchant, 4 Dean street, NEWCASTLE-ON-TYNE, England, is prepared to supply Gas Companies and others with every variety of appliance for the production and supply of Gas, including GASOMETERS, RETORTS (metal and clay), FIRE BRICKS, COALS, METAL MAINS, TUBES, in wrought iron, copper, brass, lead or composition, METERS, TAPS, FITTINGS, &c., &c.; and from his extensive experience in this class of work, can guarantee every thing of the best description.

JOHN ROGERSON & CO., NEWCASTLE ON-TYNE, Middlesbro'-on-Tees, London, supply Gas Coal, Clay Retorts, Cast Iron Pipes and Retorts, Gasometers, &c. A partner of the above house being now in this city, will be glad to wait upon any gas company requiring supplies.
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COWEN'S PATENT FIRE-CLAY Retorts.

JOSEPH COWEN & Co., Blaydon Burn, near Newcastle-on-Tyne, England, were the only parties to whom a Prize Medal was awarded at the Great Exhibition in London, of 1851, for "GAS RETORTS AND OTHER OBJECTS IN FIRE CLAY."

J. C. & Co. have been for many years the most extensive manufacturers of Fire Clay Retorts in the United Kingdom; and orders for FIRE CLAY RETORTS of all shapes and dimensions, FIRE BRICKS, and every other article in Fire Clay, are promptly executed at their works as above.

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Coal and Coke office,
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NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)

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GAS-HOUSE TILES and FIRE BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND articles of every description made to order at the shortest notice. B. KREISCHER, M. MAURER, A. WEBER.

PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-engineers to these Retorts, as a very superior article.

REFERENCES:—Gas-Light Works, Buffalo, N. Y.
" " Cleveland, O.
" " Chicago, Ill.

THOS. HOADLEY, 34 Front st., Cleveland, O.

CELLULAR GAS RETORTS. C. M. CRESSON'S CELLULAR GAS Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor. of Walnut and Sixth streets, Philadelphia, Pa.

GAUTIER'S CLAY RETORTS.—Fire and Arch Bricks, Gas-House Tiles, &c. Black Lead Crucibles for Steel Works and Brass Founders.
MANY, BALDWIN & MANY, 49 John-st., N. Y.

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BELGIAN FIRE-CLAY GAS RETORTS,
Dealers in Tiles, Arch-Bricks, Furnace-Doors, Mouth-Pieces, Covers, and all other Fittings, of the most approved patterns, for setting Clay Retorts. Sabbaton's Patent Furnace-Doors and Frames, Floyd's Patent Malleable Iron Retort Covers, McKenzie's Patent Gas Exhausters, made by Addison Smith, Compensator Valves, &c. Gas, Water, and Steam Tubes.

CLAY RETORTS.—J. K. BRICK & Co.—Brooklyn Clay Retort and Fire-Brick Works, Van Dyke, near Van Brunt street, Brooklyn, N. Y.—Manufacturers of Clay Retorts, Fire Brick, Gas and Hot House Tiles, Arch, Furnace and Cupola Brick, Fire Cement, Mortar, &c.

J. K. B. & Co. would invite the attention of Gas Companies to the important fact, that the Clay Retorts manufactured at their Works can be set without Tiles, requiring to be supported only at the front and rear ends, thereby exposing the entire surface of the Retort to the direct action of the flame from the furnace.

The results of this mode of setting, are a Saving of Fuel, Tiles, Transportation of Materials, Labor and Space, thereby enabling Gas Companies to set Retorts of at least 50 per cent. greater capacity than those usually employed in the ordinary arches.

ENGLISH FIRE BRICKS, Rufford's Stourbridge Bricks, Stourbridge and Welsh Clay.
S. THOMPSON'S Neph., IMP'R, 45 Gold-st.

JOHN NEWKUMET, Philadelphia Fire-Brick Works, Vine and Twenty-third Streets, Philadelphia.

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

FOR SYMMES' PATENT RETORTS, Mouthpieces, &c. address—
ELLIMAN BROTHERS, 217 Pearl-st., New York.
MORRIS, TASKER & CO, Philadelphia.
HORATIO EAGLE, 254 Canal-St., New York.
Or H. K. SYMMES, Newton, Mass.
See Engravings in AMERICAN GAS-LIGHT JOURNAL for July 1, 1860, page 280.

KENNEDY'S Method of Securing Iron Mouth Pieces to Clay Retorts.—The Retort is made in the usual form, but without any bolt-holes through the flange. An iron collar made in two pieces, is then placed around the Retort behind the flange, and bolted to the mouth-piece by bolts which pass just outside of the flange instead of passing through it. As each Retort costs about $30, and as the breaking out of the bolt-holes entirely ruins the whole Retort, the importance of this simple but valuable improvement will be readily appreciated.

By this improvement the mouth-piece is firmly attached to Clay Retorts in a simple and very substantial manner, the bolts passing from the yoke to the mouth-piece on the outside of the Retort. The yokes are furnished at a low price, ready to be put on. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245. Address the Patentee,
JOHN P. KENNEDY, Trenton, N. J.

THE AUBIN GAS-WORKS CO., No. 44 State street, Albany, N. Y., will refer parties wanting GAS-WORKS FOR VILLAGES to seventeen of their Village Works now in operation in the United States, and the Canadas in *every one of which the profits of the company are ten per cent. and upwards, and yet good gas is furnished.* Agents wanted to extend the sale of the AUBIN PORTABLE GAS STOVE for dwellings, factories, &c., which will make 1000 feet of gas in five hours, and with greater simplicity, safety and economy, than any other known apparatus.

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Cast Iron Street Lanterns, neat and very durable.

For sale by JOHN JEFFREY, Cincinnati, Ohio.

Street Lanterns cast in three pieces, which are fitted together without bolts, rivets, solder or other fastenings; glazed without tins, putty, or catches; the glass slipping into grooves cast in the lantern. These lanterns have been adopted, and are now used, by the City Councils of Cincinnati, O., Covington, Ky., and other cities.

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R. D. WOOD & CO., Manufacturers of Cast Iron, Gas and WATER PIPE; RETORTS, LAMP-POSTS, &c. S. W. corner 4th and Chesnut streets, Philadelphia. Works at Millville, N. J.

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DEALERS IN WROUGHT IRON Pipe, and Manufacturers of Fittings for Steam, Gas, and Water, Nos. 62 and 64 Gold street, (between Beekman and Fulton streets,) New York.
THOMAS H. NORRIS. CHARLES GREGG.

TO GAS AND WATER COMPANIES:

The undersigned, Agent for Messrs. Thomas Edington & Sons, Phenix Foundry, Glasgow, Scotland, is prepared to contract for all descriptions of Cast-iron Pipes of their manufacture.

About 6000 tons of these Pipes have lately been supplied to the Brooklyn Water-works, N. Y., and the Chief Engineer of the Works, A. P. Kirkwood, Esq., is ready to testify to their excellent quality.
ARCHIBALD BAXTER,
90 Broad-st., New York,
Sole Agent For the United States and Canada

BERGEN IRON WORKS. Established 1833.
R. A. BRICK, Manufacturer of CAST-IRON WATER and GAS PIPES. RETORTS, PIPES, &c., always on hand, Office 109, Leonard street, New York.

GREENE ST. IRON FOUNDRY and Machine Shop, 37 to 43 Greene street, (Office, No. 39) near Grand, New York.
Cast Iron Soil and Drain Pipe, Tees, Bends, &c.
A. & E. B. BRADY.

WEST TROY, (N. Y.,) IRON FOUNDRY.
AUGUSTUS VIELE, Manufacturer of Gas and Water Pipes of all sizes. DRIPS, SYPHONS, BENDS, AND BRANCHES. The manufactures of this establishment are in use in various Gas and Water Works throughout the country.
Address AUGUSTUS VIELE, West Troy, N. Y.

HOPE IRON FOUNDRY, PROVIDENCE, R. I.
Gas-Work Castings of every description.
They would call attention to their superior IRON RETORTS, which are extenivsely used with good satisfaction; also to E. WALCOTT'S PATENT MOUTH and LID, possessing important advantages over any other in use, and are shown in a circular which can be obtained by addressing—
JOS. P. MANTON, Agt.

EXCELSIOR IRON WORKS.—GEORGE R. JACKSON & Co., (Successors to Cornell & Jackson,) 201 Centre street, cor. of Howard, New York.—Fire-Proof Doors, Vaults, Safes and Shutters, Enameled Grates and Fenders, Iron Railings, for Public Buildings, Dwellings, Balconies, Verandahs, Stair-cases, Parks and Tombs, Prismatic Platforms and Vault Lights, Columns, Girders, and all kinds of Castings for Building purposes.
☞ Casting for the Trade.

OREGON FOUNDRY, Nos. 740, 742, 744 Greenwich street, New York.
HERRING & FLOYD, proprietors, manufacture Gas Compensators of all sizes, Self-Acting Valves, Exhausters upon an improved plan, casting less than half those of English manufacture, also castings of every description for Gas and Water Works.

Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire; also Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see AMERICAN GAS LIGHT JOURNAL for October, 1859, pages 65 and 71.

Samples of the above castings can be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

STUART & PETERSON, Willow street, above Thirteenth, Philadelphia, Manufacturers of LAMP POSTS and CAST IRON STREET-LANTERNS.

P. S.—Our Cast Iron Lanterns are warranted to out last three Tin Lanterns.

S. V. MERRICK, J. VAUGHAN MERRICK,
W. H. MERRICK.

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MERRICK & SONS, Engineers, manufacturers of every description of Gas Machinery.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either TELESCOPIC OR SINGLE, WITH SUSPENSION FRAMES COMPLETE; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Lime Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
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WROUGHT-IRON PIPES, AND FIXTURES
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CAST IRON STREET MAINS; *Bends, Branches, Chemical Retorts, and all kinds of Castings for* GAS-WORKS, either COAL or ROSIN WORKS. SHEET IRON FOR GASOMETERS *cut and punched to order.* BOILER IRON *of all descriptions.* RUSSIA SHEET IRON, TIN PLATES, BLOCK TIN, COPPER, PIG LEAD, SPELTER, and Metals generally.

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REFERENCES:
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PHILADELPHIA, manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap Welded Boiler Flues,
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CAST AND WROUGHT IRON Pipe, Branches, Elbows, Sleeves, &c. Lamp-posts, Wrought iron Lanterns for Lamp-posts, Gas Retorts (clay or iron), Street Mains in 9 or 12 feet lengths. Sheet iron cut to pattern for Gas-holders. For sale by the manufacturers. Agent,
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AMERICAN TUBE WORKS.—W. G. Smith & Co., Forty-sixth street, east of 10th Avenue, New York City. Manufacturers of
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Office 1908 Market street, Philadelphia.

PIPE, PIPE, PIPE, PIPE, PIPE.—Plumbers, and all others who use Cast-Iron Drain Pipe, will do well to call at the Pipe Foundry, 39 Greene street. A large lot of Five and Six Inch, Seven Foot length, on hand, and for sale low. A. & E. B. BRADY.

WATERHOUSE & BOWES, Builders of Gas-Works, Raleigh, N. C.—Gas-Works erected in any part of the United States.

REFERENCES.

J. H. Carson,	Pres't, Charlotte,	N. C.	Gas-W'ks.
D. G. Fowle,	do. Raleigh	do.	do.
J. C Smythe,	do. Salisbury	do.	do
Arch. McClean,	do. Fayetteville	do.	do.
Jos. A. Waddell,	do. Staunton	Va.	do.
A. G. Story,	do. Little Falls	N. Y.	do.
G. H. Young, Prop'r	Waverley	Miss.	do.

Wm. Johnston, President of Charlotte & S. C. R. R., Charlotte, N. C., A. B. Wood, Agent Reading Iron Works, 57 Maiden lane, N. Y., Cornelius & Baker Manufacturers of Gas-fixtures, Philadelphia.
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BENJAMIN PIKE & SONS, Opticians, Importers and Manufacturers of Mathematical and Philosophical Instruments, No. 518 Broadway, (opposite St. Nicholas Hotel), New York.

Gold, Silver and Steel Spectacles; Barometers, Thermometers, Surveying Compasses, Theodolites, Levelling Instruments, Opera Glasses, Telescopes and Microscopes; Air Pumps and Electrical Machines. Instruments and Spectacles repaired. Periscopic Glasses and Pebbles.
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PORTABLE GAS WORKS.—S. T. McDOUGALL'S PATENT Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making, and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center Street, New York.
Agents wanted in other cities to sell rights or machines.

WOONSOCKET, R. I., GAS CO.—At the Annual Meeting of the Woonsocket Gas Company, held on the 3d of September, the following Directors were elected for the ensuing year:—Henry C. Kimball, Hiram Allen, O. J. Rathbun, Estes Lamb, Willis Cook, Joseph E. Cole, E. B. Newell, Royal C. Taft, and Bradbury C. Hill.

The Directors hold monthly meetings on the 2d Tuesday in each month, at 11 o'clock, A M.

A Dividend of 4 per cent. was declared on the capital stock of the Company, payable on and after Monday, October 1st, 1860.
R. G. RANDALL, Sec'y.
Sept. 1, 1860.

KING BROTHERS,

STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.

KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

FREE FROM CRACKS AND CORRECT IN FORM.

By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABBITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

GEORGE WRIGHT & CO.'S

LIVERPOOL AND NEWCASTLE CANNEL AND COAL

FOR GAS MANUFACTURE AND HOUSE USE.

THE undersigned does not submit for comparison the result of chemical analysis, as this plan is too often adopted to promote the sale of inferior or worthles coals that in practice bear no particle of resemblance to their theoretical, and sometimes distorted descriptions.

He is authorized, however, to guarantee the *careful shipment of the best qualities of Cannel and Coal, at the lowest rates of Invoice and Freight offered at time of engagement;* and any losses sustained by short weight, or the neglect of the conditions mentioned, will be promptly and cheerfully repaired.

OFFICE OF THE MANHATTAN GAS-LIGHT COMPANY,
New-York, October 8th, 1859.

Messrs. GEORGE WRIGHT & Co., Liverpool:

Gentlemen,—For many years you have acted as agents for this company, purchasing for, and forwarding to them, coals, retorts, and other gas apparatus.

Your experience, ability and sterling integrity, entitle you to and have secured our confidence, and we cheerfully recommend your house to all gas companies desiring the services of an agent in England. My own personal knowledge of the superior quality of the coals within your control, and my acquaintance with the manufacturers of such articles as can be advantageously procured by you in England for gas companies abroad, added to my high regard for you personally, induce me to write this letter, and express the hope that you may be able to extend your business in this country, not only for your own advantage, but also for the benefit of those who may confide in you as securely as we have done.

I am, gentlemen, your very obedient servant,

CHARLES ROOME, *President.*

T. W. PARMELE, Agent,
No. 4 Irving Place, New-York,

GAS-EXHAUSTERS,

GOVERNORS, FURNACE DOORS,
RETORT-COVERS, CASTINGS,
IMPLEMENTS,
PHOTOMETRICAL AND METER-PROVING APPARATUS.

HARRIS & PEARSON,

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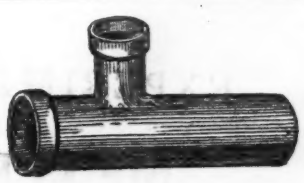
BEST GLASS-HOUSE POT, AND CRUCIBLE CLAY.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

PAMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.



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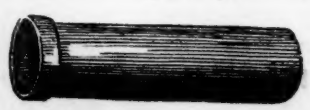

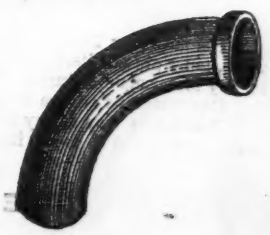

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MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

THOMAS GLOVER introduced his PATENT DRY GAS METERS into the United States and Canadas in 1846, and since that time he has received extensive patronage from many Gas Companies of those countries as well as from this. Thomas Glover confines his sole attention to the business of Gas-Meter making. The propriety of his doing so is satisfactorily proved by his success. For example: one London Company has now in use above 12,500 of his Patent Dry Gas-Meters, and some of these Meters have been fixed for fourteen years and are still in working order, without complaint from either the company or the consumer.

THOMAS GLOVER thinks it necessary to put Gas Companies on their guard against parties selling Patent Dry Gas-Meters constructed in imitation of his, but unskilfully made on erroneous principles, and with improper and unsuitable materials.

THOMAS GLOVER'S Workshops are now the most extensive in this or any other country, and he is thereby enabled promptly to execute orders to any extent required. Purchasers may, at any time, inspect his Works and the materials of which his Meters are constructed.

Suffolk Street, Clerkenwell, London, and 1 Barrett Street, Fulton Street, Boston.

SAMUEL DOWN,

Nos. 340, [342, 344 and 346 West Twenty-second Street, North River, NEW YORK CITY,

MANUFACTURER OF

WET AND DRY PATENT GAS METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves Governors, Compensators for Exhausters, and the Standard Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature. Also, Bunsen's Photometer, with complete Apparatus for working the same.

*The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy d several other distinguished scientific gentlemen.

JOSEPH LENNIG & CO.,

Nos. 313 and 315 NEW MARKET STREET, above Vine Street,

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MANUFACTURERS OF

WET AND DRY

PATENT

GAS-METERS,

STATION,

SHOW, CUSTOMER,

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METERS,

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GUAGES,

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FLUID GUAGES, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us.

Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired.

METERS REPAIRED AND FORWARDED WITH DISPATCH.

GAS AGITATION AT CLEVELAND, O.

It appears by the following, from the Cleveland *Leader*, that the infection of cheap gas has caught the people in that city.

The close monopoly enjoyed, and the prices charged for light and coke by the present Gas and Coke Co., very naturally excite no little interest in the community and the organization of a new gas company, with a view to cheaper light and coke, meets with much favor. Some of our most substantial citizens are connected with the new Cleveland Gas-Light Co., and at the last meeting of the City Council, a communication was received asking permission to lay down pipes in the streets of the city, and referred to the committee on gas. At the same meeting an ordinance was introduced, which fixes the price to be charged by gas companies to private consumers at not over $1 75 per 1000 feet, and for lighting the streets at not over $1 25. Any company refusing to accept these prices, to forfeit all their rights and privileges in relation to the use of the streets for the pipes. Some ordinance of the kind will be heartily approved by the people.

The gas question has been for some time in the hands of a special committee of the Council, the result of previous negotiations for a reduction of the price of gas not having been satisfactory. The special committee after a full examination of the subject, have reported in favor of purchasing the present works or erecting a City Gas Works, as being the best and most economical plan, and we append their interesting and well considered report:

To the City Council of the City of Cleveland:

Your committee, to whom was referred a resolution of this Council directing them to ascertain the cost of erecting a City Gas Works, and the expense of laying down main pipes for conducting gas through the streets of the city, and whether, in their opinion, the best interests of the city and its citizens would not be promoted by the erection of a gas works by the city, beg leave to report:

That they have had the subject under consideration, and have carefully examined all the questions bearing on the matters submitted to us, and have become perfectly satisfied that the best interests of the city and of private consumers, can be more thoroughly and completely secured by the erection of a city gas works, to be owned and controlled by the city, than by any other means. The great importance of this subject, in consequence of the large pecuniary interest to the city and the citizens, has led your committee to give it that candid, careful and thorough examination, which would enable them to determine what would be the most proper course for the city to pursue in order to secure the greatest benefits to the city, and to satisfy the just expectations of our citizens who are demanding a good light at a reasonable price.

From an examination into the history of gas works in this country and Great Britain, your committee would state it is an undeniable fact, that in all the municipal corporations owning the gas works within their limits, gas is furnished for public and private consumption at much lower rates than is furnished to the city or citizens where the works are not so owned. That in all places where the works are owned by the corporation, they have been, and are still, a source of profit.

The two great objects to be attained by the city owning its own gas works are—cheap and good gas to its citizens, and an additional source of revenue to the city. The most notable example of these results is the city of Manchester, in England. The gas is furnished to consumers at 4s. 6d. per thousand cubic feet, and since the works have been owned and controlled by the city, the revenue derived from them for the use of the city, after paying all expenses, amounts to the sum of £840,000. The results are similar in this country, although the profits are not so large.

Your committe venture to make the assertion, that not a place can be found where the works are owned by the city, town or village, that they have not, in every instance, furnished gas cheaper to the consumer, while at the same time they have been a source of revenue to the city.

In view of these facts, your committee can come to no other conclusion, than that the best interests of the city and citizens require the city to own and control the gas works within its limits.

Your committee would therefore report, that works of a capacity to meet the wants of this city for twenty-five years, can be erected at a cost not to exceed the sum of fifty thousand dollars, and included in that sum is an amount sufficient to lay down five miles of mains. The average cost of a mile of main is about two thousand dollars. Could the funds be obtained at once to extend the mains twenty-five miles, great benefits would result to the city, for the reason that labor is cheap and seeking employment, and gas pipe can be obtained at a lower rate per ton than at any former period. No more favorable time than the present can present itself to the city or its citizens, to embark in an enterprise so beneficial to them in a pecuniary point of view, and one which will so greatly add to their prosperity. Taking the first quarter's payment for lighting the city as a basis for an estimate, the cost of lighting the city for the year 1860 will amount to the snug sum of $15,000. This sum has to be taken from the general fund annually, and it will increase annually. Now this sum in six years, with the increase properly belonging to it, would build a gas works and lay down more miles of pipe than the present gas company have laid.

Your committee, believing that the interests of all the citizens of the city are paramount to the corporate interests of a few individuals, would recommend that the city purchase the gas works owned by the present company, at their fair valuation; but if said company will not sell, that then the city proceed at once to erect gas works of their own. The true interest of the city and its citizens demand it, and your committee cordially recommend it.

All of which is respectfully submitted.

C. L. RUSSELL, Chairman.

The Annual Report * of the Pittsburg Gas Company, recently published, presents some facts and figures which may reflect some *light* on the gas question here. It shows the profitableness of gas manufacture there in a strong *light* at all events. We present some of the items.

The total length of pipes now is about 29 miles. The coal carbonized during the past year, amounted to 209,928 bushels, and the total amount of gas distributed during the year reached 68,139,213 cubic feet. The number of services to private consumers is 2,825, and the public lamps number 548. The report states that the demand for coke and tar has been quite active during the latter part of the year, and at present greatly exceeds the amount produced at the works, and the applications for the supplies of coke are still increasing.

The recent dividends of the Company are rich! In January, 1860, a dividend of five per cent. was declared, amounting to $15,000. In February, 1860, *another dividend* of five per cent. was divided, amounting to $18,980; and in July, 1860, *another dividend* of $2 per share, amounting to $15,929.20. Thus the amount of dividends had, within less than seven months, reached the sum of $49,909,20. The capital stock of the company now amounts to $389,600. Like Cleveland Gas Company stock, we presume it is seldom, if ever, in the market.

The municipal corporation of the city of Pittsburg, now holds no stock in the Gas Company. During the last session the Legislature of Pennsylvania authorized the surrender of the stock held by the city, upon terms mutually advantageous, and which were shortly after ratified by the City Council, and acceded to by the stockholders. How advantageous to the city and people may be judged from the fact that the debt owing by the city to the company for public lamps was cancelled, and the provisions secure an annual supply of gas for the public lamps and city offices, abundant for ordinary consumption, free of charge, with a very low rate for extraordinary demands, and further provide that the price of gas to be charged to individual consumers shall never exceed the present rate of $1.25 per 1000 feet.

Of course Pittsburg, from its location, must have advantages for cheaper production of gas than Cleveland, and the nights are longer and darker than on the lake shore. As in Pittsburg, coke and tar, however, find ready market here, and coke alone, as sold here now at $6 per hundred bushels at the works, must be quite an item in paying for the coal carbonized. In the report of the company, in response to a resolution of the Council, if we recollect right, this source of income was not deemed worthy of mention.

IMPERIAL GAS-LIGHT CELEBRATION IN PARIS.

The Emperor cannot get along without gas, either in his personal glorifications at home or in consummating his shrewd diplomatic obfustifications at the Congress of Sovereigns. A correspondent of *The World* gives the following interesting account of the blaze of gas-light at the recent *fête* in Paris, on the occasion of His Imperial Majesty's birthday.

THE ILLUMINATION.

The great feature of the *fête* was the illumination at night. This has always been on a scale of great magnificence, but never before so imposing and beautiful as on Wednesday evening, August 15. The centre of the illuminations was the Place de la Concorde. Here, circular frames of lattice-work had been erected around the two principal fountains, and these were connected by a long balcony, and hung with thousands upon thousands of the brilliantly illuminated little glass tumblers, and which were of every hue and color. Crowns, stars, and eagles were woven in among the lattice work, and everywhere the letter "N" blazed in brilliantly colored light. Through the lights the fountains were seen playing, the many colored hues falling upon the spray, and tinging it with the blended shades of the rainbow. Looking southward from here, through the main avenue of the garden of the Tuileries—which was hung on both sides with festoons, add garlands, and wreaths, and crowns, and crosses, and N's of light—the splendid illumination in front of the palace was seen, and looking upward through the avenue of the Champs Elysees, which, for the distance of half a league was also festooned on both sides with the many colored lamps, we saw the triumphal arch, which was one blaze of gas light. All around the garden of the Tuileries were frames, on which the imperial devices were reproduced, and on both sides of the river, on the Rue de Rivoli, and on the quays, all the public buildings were ablaze. One of the most curious effects of the illumination was produced upon the palace of the Legion of Honor. The main portion of the building was perfectly dark, and none of those immediately adjoining it were lighted, so that, in fact, the building itself could not be seen; but from the roof blazed a single cross, the cross of the Legion of Honor, seemingly perfectly isolated and hanging in the air. I took a walk up the Champ Elysees as far as the Triumphal arch, and, looking back, witnessed a fairy-like scene which beggars description and which even imagination cannot picture. The lighted festoons extending on either side for two miles; the brilliantly blazing roofs of the public buildings and the bridges; the palaces of light in the Place de la Concorde; the colored paper lanterns hung everywhere among the trees; the gay streamers floating from thousands of masts,; the throngs of people on whom the glare of the brilliant light fell; and the bright blue sky and pale stars overhead, all formed a scene such as I had only dreamed of before, after reading some oriental tale of enchantment. But with all this gorgeous, brilliant, quiet beauty before me, I must confess that my thoughts were carried back to other scenes, which not a century ago were enacted on that very spot on which a fairy palace is now erected. It was as often thronged then with people as it is now, but it was not to glad the eye or cheer the heart with forms of beauty that they came there and gathered in the Place de la Concorde. Already gorged and well nigh glutted, with blood, here they rushed, men, women and children, to gaze upon the horrid guillotine, and to see the heads of its victims fall. There, where the obelisk of Luxor stands, where those fountains are sending up their joyous streams, where those terraces and balconies of brilliancy are blazing, there stood for two years the guillotine, and there the heads of Louis the Sixteenth, the beautiful Marie Antoinette, the enthusiast Charlotte Corday, the noble Madame Roland—Robespierre, Murat, and Danton—king, queen, revolutionist and conspirator, rolled from the stroke of the bloody axe into a box of sawdust, amid the fiendish shouts of the throng. And that throng was the ancestry, the grandfathers and grandmothers of those same people who stand there now, of those men and women, so sensitive and so polite, that if even in this crowd they jostle against you by accident too roughly, they overwhelm you with apologies and beg your pardon a thousand times. The grandfathers and grandmothers of these same people raised the terrible cry of "Bread or blood," and when they were bearing the royal family through the streets of Paris sang that horrible refrain intimating that they would now have cheap bread, for "We've got the baker, and the baker's wife, and the baker's little shop boy." I know not why it was, but gazing on the brilliant sight before me, I could not help recalling these terrible scenes. Will they ever be reproduced?

THE NUMBER OF LIGHTS.

Being somewhat inclined to statistics, I made a little calculation of the number of hanging lamps in the avenue extending from the palace, through the garden of the Tuileries, and up the Avenue des Champs Elysees—in each of the festoons, of which there were double rows on either side, and in the ornament which capped the poles to which they were suspended, were 160 lights. In the avenue of the garden there were, on both sides, one hundred and six of these festoons, which would give for the hangings of the avenue of the garden alone 16,960 lights. The length of the avenue of the Champs Elysees, which was hung in the same manner, is five times that of the avenue of the garden, which would therefore give the number of hanging lamps in the festoons extending from the triumphal arch to the palace of tho Tuileries at 101,760 lights. Probably in the illuminations on the Place de la Concorde, and on the public buildings, and in the garden of the Tuileries, and the Champs Elysees, there were twice as many more; so that the illumination would require *over Three hundred thousand separate lights!* The first part of the day was gloomy and rainy, but it cleared off beautifully towards evening, and probably more than 500,000 persons were out, enjoying the illumination. The expense of this *fête* to the city is said to have been about one million of francs—*two hundred thousand dollars.*

WASHINGTON, D. C.—On page 133 of Vol. I. of this JOURNAL is a description of the great national gas-works at this place—the seat of the Federal Government. One would think that they would be sufficient to supply so sparsely settled a village with gas, and that the quantity being so abundant, the enormous deficiency of quality would be in a measure compensated for. But Messrs. Battin, Dungan & Co. had the hardihood to erect an opposition (not competing) works at this place; and we feel bound to add that theirs is the only gas that possesses the least illuminating properties. That from the other establishment is used solely for heating purposes. The new works were built in 1848, for rosin, but in 1851, were rebuilt by Samuel R. Brick, and adapted for coal, and are now entirely adequate to the requirements of the benighted neighborhood in which they are placed. J. K. Brick & Co.'s clay retorts have been lately introduced with much success, with a large number of Merrick & Son's iron ones. Code, Hopper & Gratz's meters are used, and three gas-holders—one of 600 M., and one of 300 M. feet, built by Merrick, and one of 100 M., built by Aymer. About 56 miles of mains are laid, of 3 to 20 inches diameter. Clover Hill coal is carbonized, costing $5 per 2,240 lbs. This company has been eminently successful. Congress, forced to admit the superiority of its gas to their own, pay some $1,500 per week for the privilege of using it. The nation pays Congress a much larger sum than that per day for the miserable and offensive fluid it emits while its works are in operation.

WASHINGTON, PA.—A much more reputable town than its namesake, (D. C.) with a compact little gas-works, built by Stephenson. The works were not spoken of with much praise when delivered to the company, who have improved them greatly. Merrick & Sons iron retorts are used with Jones & Lennig's and Code, Hopper & Gratz's meters. About 10,000 feet mains of 2 to 4 inches are in use. No charge for meters.

* This Report will be found in this number of the AMERICAN GAS-LIGHT JOURNAL.—ED.

THE BEAUTIES OF BURNING FLUID.

Here we are again, with a photogram of the blushing charms of this seductive Borgia.

BURNING FLUID ACCIDENT.—We learn that a little daughter of Mr. Eddington, who resides on Eighth street, between Spring and Wells, Milwaukie, was severely burned in the face and on one of her hands, by the upsetting of a fluid lamp, on Saturday evening last. It is almost a miracle that some of the other members of the family—who were near by at the time—were not also terribly burned. The flames, which set the room all ablaze, were extinguished before material damage was done to the house.

ACCIDENTS FROM BURNING FLUID.—Almost every day we have to chronicle some accident or loss of life by the use of camphene or burning fluid. By reference to our advertising columns, it will be seen that the Water Oil Company advertises an oil that will burn in fluid lamps and is not explosive. If this is what it professes to be, its inventor should be ranked among public benefactors, for there is no domestic want so great as that of a *cheap* and *safe* method of lighting our houses and shops during the long evenings of this latitude, and especially so if a private corporation is to have a monopoly of gas in our city for more than a quarter of a century to come.

SHOCKING DEATH FROM BURNING FLUID.—On the 26th ult., Captain Rufus Shepard, of Granger, Alleghany County, New York, in attempting to fill a lighted camphene lamp from a two-gallon can, caused an explosion, which set his clothes on fire. His wife came to his rescue, got him out of the house, tore off his remaining clothing, and extinguished the flames. He lived only six hours after the accident. The house and all its contents were consumed.

THE BEAUTY IN ROCHESTER, N. Y.—EXPLOSION OF A FLUID LAMP—A DWELLING ENDANGERED BY FIRE.—A fluid lamp exploded last evening at the house of Dr. N. S. Barnes on North Clinton street, set the house on fire, and but for its timely discovery it would have destroyed the building. The lamp was properly trimmed, lighted, and stood upon the mantle shelf against a stone wall covered with paper. The family were absent, and the girl went out for a few moments, locking the house and taking the key. A short time after Mr. Darrow, who was passing that way, saw an unusual light in the house of Dr. Barnes, who came along about the same time. The Doctor forced a window to get in, found the paper on the wall on fire, and a fair prospect for a conflagration. He put out the fire and then looked for the origin. It proved to be in a fluid lamp, the top of which had blown out, throwing the burning compound upon the wall and things about. The lamp happened to be left in a spot most favorable to an explosion, as there was less combustible material about it than in any other part of the room.

A PORTION of the ceiling of the store No. 8 Franklin street, loosened last night, and the camphene lamp attached to it fell, completely saturating and setting fire to the clothes of Ellen Flyn, aged twelve years, who was standing under it. A neighbor, with rare presence of mind, seized the girl, and wrapping her in his coat, immersed her in water, and thus, probably, saved her life, though she was badly burned. She was conveyed to the New York Hospital.

USES OF THE MINERAL OIL.

It has been asked what is the use of the oil now being pumped out of the oil wells of Pennsylvania? A writer says:

1st. In medicine it has long been used under the name of Seneca oil, and is a valuable liniment, possessing nearly all the virtues of arnica, &c.

2d. As a solvent of gums, gutta percha, India rubber, &c., it is said to be preferable to any other articie.

3d. In the manufacture of gas it is said to be cheaper and better than the best fish oil.

4th. It is now used to a certain extent for lubricating purposes, but experiments are in progress which justify the belief that it can be made one of the best lubricators in the world.

5th. For export it is worth all it costs, and is already extensively shipped to foreign markets. But

6th. As an illuminating oil, it excels everything yet produced. It is already adopted to a great extent by the various railroad lines, and government has just closed a large contract for it to supply the light-houses on our coast. In fact it possesses 25 per cent. more illuminating power than the best coal oil, and from the fact that it does not chill in the cold, is far superior to the best sperm oil. In fact, Messrs. Editors, coal oil no longer pays for making, and soon the poor whale will be followed only for his bones.

COMPLETION OF MINOT'S ROCK LIGHT.—The new light house on Minot's Rock has been completed, and last evening the lantern was lighted up for the first time to test the power of the light. The lantern was covered so as to prevent the light from being seen by inward bound vessels, but was open toward the shore. The light was a very powerful one, and could be seen from a great distance. By the side of it the lights on the light ship seemed like farthing candles. We congratulate the mercantile community upon the completion of this important light before another season of storm and disaster. The work has been prosecuted to completion with much vigor by Capt. Alexander, of the Engineer Corps, the Superintendent, to whom great credit is due for its early completion.—*Boston Journal.*

For the AMERICAN GAS LIGHT JOURNAL.

COAL-OIL.

The attempt through the columns of *Silliman's Journal* of some pseudo-chemist not practically acquainted with the manufacture of coal-oils, to attack the validity of the coal-oil patent of James Young, of Glasgow, Scotland, under the mask of a pretended review of Dr. Antisell's modest and really meritorious work, recalls very forcibly to my mind, the language of Judge Grier, one of the Justices of the Supreme Court of the United States, in his opinion rendered in the case of Livingston, Copeland, & Co., vs. Jones, Wallingford, & Co., decided last year in the Pennsylvania Circuit.

It is so very *apropos* to the present occasion, that I can not forbear making the following extract:

"Experience has caused me to have but little confidence in the opinion of *experts* and *professors*, who have often more knowledge than judgment. Courts and juries may be benefited in their researches by the one, *while they would be led into great error by confiding too much to the other.*

"The art of printing was stumbled over for five thousand years, but if a patent for it were presented to an expert, he would show you at once that the whole art of printing consisted in multiplying impressions from a combination of movable type. He would point you to the tracks of animals, as original impressions from movable types and show the invention of printing to be as old as Adam.

"Few patents could stand the test of such ingenuity as this. Incredible as it may appear, yet it is nevertheless true, that on the trial of the originality of Morse's Telegraph, it was gravely urged that two thieves in the penitentiary who had corresponded by means of scratches and dots on the prison walls, had preceded Morse in the invention of this most astonishing and useful art."

It is a well known fact that the science of chemistry is rapidly becoming contemptible in the community, or at least among such portion of the people as are aware of the undeniable fact, that no new and useful invention has ever been made and patented that involved the discovery or new and useful application of anything appertaining to chemistry, that has not been attacked by professional chemists of apparently high standing among their brethren, and attempted to be overthrown on the score of want of novelty, by the aid of their sworn opinions in a court of justice, whenever grasping and unprincipled infringers were ready to pay them money to assist them in their piracies.

PARRAFFINE.

CINCINNATI, O., Sept. 8, 1860.

REDUCTION IN THE PRICE OF GAS AT PORTLAND, ME.—A correspondent writes as follows to the Portland. *Advertiser:*

I see by the *Argus*, of Saturday morning, that the Directors of the Portland Gas-Light Company have reduced the price of gas to three dollars per thousand feet, on all bills paid within five days after they are presented.

Now, can any one give a good and sufficient reason for this reduction, just at this time? Heretofore the Directors of the Company, and the "C. B. and C. H. Clique," have contended that the price of gas was put as low as it could be afforded; that those who were in favor of the city having the control of the company, wanted the price reduced, which could not possibly be done without the company suffering a loss; and that if the price was reduced, the per centage to be paid on the stock would not be such as to make it a profitable investment. These arguments have been used by the President of the company, and his supporters, with a great deal of pertinacity, and yet all at once, on the eve of our September election, this sudden reduction has been made. Has there been any sudden fall in the price of coal which justifies this? Has the expense of manufacturing gas been lessened in any particular way since the time when the objections above named were so strenuously urged? Oh, no! But as the city has been wronged out of its proper and controlling influence in that company, by the outrageous course of a few aldermen, backed up by a facile Mayor, the President and Directors, in order to appease a just and righteous indignation of the citizens at this shameful sacrifice of their rights by the action of the aldermen in refusing to subscribe for the city's share of the additional stock, have thrown out this sop in the shape of a reduction of price. Well, gentlemen, the citizens are not to be gulled in this way. You may reduce your price of gas, but that wont save you, nor this present city government, which has already become a stench in the nostrils of a great majority of the citizens. The question must come up. If this reduction can be made now, why could it not have been made before? One thing is sure. either the gas consumers have been wofully imposed upon heretofore, or else the company cannot afford to make this reduction of one-seventh, or fourteen per cent in the price now.

Can an explanation be given? If so, I dare say the citizens would be glad to have it. H.

COAL OIL ON BED BUGS.—Coal oil is said to be a sure destroyer of bed bugs. Apply plentifully with a small brush or feather to the places where they most do congregate. The cure is said to be effectual and permanent. Gilt frames, chandeliers, &c., rubbed lightly over with coal oil will not be disturbed by flies. So says a paper in the rural districts; no doubt it is *post*-ed.

GAS BURNERS.

Scarcely anything connected with the subject of gas illumination has commanded more attention than the means whereby gas may be burnt to the best advantage, and although the greatest ingenuity has been displayed in the construction of many of the burners which have at different times been invented, yet very few of them possess that universal applicability for which they have in most cases been so highly commended. The reason of this is obvious; different kinds of gas require different forms of burners, in order to effect perfect combustion. As a rule, it may be stated that the rich cannel gases are best consumed from burners with very fine apertures, while the poorer gases—those that contain less than five or six per cent. of condensable hydro-carbons—are burnt with most advantage from larger apertures. Again, in the former case, provision should be made for a large supply of atmospheric air, as by spreading out the flame by means of an internal button, or by using tall glasses: whereas, in the latter case, the very opposite should be observed. It is evident, therefore, that no single burner can be so constructed as to secure both of these requirements; and, consequently, that any burner which is well suited for one kind of gas, is altogether unfit for the other. Another point of importance is, that when several jets issue from the same burner, and blend together or coalesce, the light is always improved; for it is the property of one jet to assist another by elevating its temperature, and thus a greater heat and a brighter flame are the result of the union.

FRAUDS ON THE DETROIT, MICH., GAS-LIGHT COMPANY.—The *Detroit Advertiser* notices the operation of one John Boyle in that city, through whose instrumentality quite extensive frauds have been practised upon the gas company. It was ascertained that Boyle had for three or four weeks been instructing the people how to arrange their meters so that they would pass the gas without registering the quantity, or only part of it, at the option of the consumers, and detectives were put upon his track. The result was, that on Tuesday night he was arrested, and also Squier P. Collins and Mrs. Heck, on warrants issued by Justice Lane, on charge of conspiracy to defraud the gas company.

The last two named, it is alleged, had allowed Boyle to fix their meters in the manner alluded to, and had paid him a large sum for so doing. It is stated also that Boyle has received considerable amounts of money, not only for altering the meters of citizens, but also from others to whom he has sold "rights" and "instructions" for other cities and towns.

The Detroit Gas Company are much alarmed at this attempt to defraud them of their revenue, and believe that Boyle has effected a loss to them which has increased with every job he has done, till for the past few nights it has reached the handsome amount of twenty-seven thousand feet per night, or in money $81.

It is said, and probably with truth, that Boyle has operated extensively in eastern cities in this same business, and it might be well for the various companies to be on the lookout.

GAS-LIGHT IN ARKANSAS.—When our last tables of Gas-Light Companies were published (July 16), there were no works in operation in this distant State. We are glad to find now that Little Rock has inaugurated them. The Arkansas *State Gazette* of the 4th Sept. says:

On Tuesday night, July 31, most of the business houses, and many of the residences in our little city, were lighted up with gas from the works of Messrs. Slaughter. The iron posts for lighting the streets have not yet been received, but will be here as soon as the river becomes navigable. This is a work decidedly progressive in its character, and evidences, what must be manifest to all who have observed, a decided improvement in the place. The Messrs. Slaughter, who have prepared these gas-works and put them in operation, deserve the greatest praise; for, notwithstanding the many difficulties in their way, they fulfilled all of their promises, and had their works in operation before the day specified in their contract.

QUEBEC, C. E.—In consequence of the visit of the Prince of Wales, the Quebec Gas-Light Company issued the following notice to its customers:

Quebec Gas Company.—Notice—Owing to the present Holiday Season, the final period for saving the discount of thirty per cent. on the last quarterly accounts, has been extended to Friday, the 24th, and Saturday, 25th instant. By order of the Directors,

P. PEEBLES,
Manager.

The Quebec Gas Company declared a dividend of four per cent. payable Sept. 1.

ADVANCE IN SPERM OIL.—About 1500 barrels of sperm oil have been sold in the New Bedford market at $1 50 per gallon, an advance of 5 cents per gallon on previous sales, which price is freely offered. Further sale of whale have been made at 50 cents per gallon.

BROOKLYN, N. Y.. WATER WORKS—PROSPECT HILL RESERVOIR.—The basin of the Prospect Hill reservoir is finished. The water when let in will stand twenty feet higher than in the Ridgewood reservoir, or one hundred and twenty-two feet above the level of the City Hall park, and one hundred and ten feet above the level of Montague street, at its intersection with Clinton. The Prospect will be supplied from the Ridgewood reservoir by a thirty-six inch pipe, and the water will be elevated by a steam-engine, to be located in Underhill avenue.

THE ACAMINE LAMP.

Ever since the introduction of kerosene and coal-oils to the public for illuminating purposes, a lamp that would burn those oils without a chimney, and afford a good light without smoke or offensive odor, has been sought for. Much inventive genius has been applied to gain this object.

At first those oils were consumed with Argand burners, with short-topped circular wicks, and a button over each central air tube, or in the old camphene lamp. These lamps were found to be inconvenient, and they have been almost superseded by the Italian kerosene, or coal-oil lamp, for alleged improvements upon which several patents have been issued from the Patent Office. Hence we have the Paragon, Waterbury, Deitz, Excelsior, and other burners, each presenting some improvement, and more and more meeting the requirements of artificial illumination.

But those lamps each require a glass chimney to induce a sufficient quantity of air to impinge upon the flame while burning, or during the period of combustion, otherwise a part of the carbon of the oil would be liberrated and rise in smoke. Also, the oil itself, from an imperfect distillation, would fill the surrounding atmoshere with unpleasant odors. Unlike the animal and some of the vegetable oils, kerosene, coal and petroleum oils, contain no oxygen to aid in the combustion at the lamp flame: this is the reason why those oils have less specific gravity than animal oils. The number of equivalents of carbon contained in the distilled oils, require a large supply of oxygen to render their combustion perfect. Burning with a limited supply of oxygen, or atmospheric air, they send up wreaths of smoke or soot, and the light is imperfect. Giving all due praise to those who have improved the Italian, or kerosene lamp, still the glass chimney, the cap with its fixtures, and the tendency to smoke and smell remain, and which no competition heretofore has been able to remove.

It is at this period in the history of lamps that Mr. Racey comes forward with his ACAMINE LAMP, for which he has obtained letters patent. This lamp is constructed with sound philosophy, and its theory is proved by its operations. It affords an excellent light from kerosene, coal, or petroleum oils, without the use of a chimney and its usual fixtures. The wick is flat and elevated, and depressed in the wick-tube by a screw. When lighted, the flame ascends between two metal plates, perforated with numerous holes, and forming a series of short tubes. The metal plates soon become heated, and the flame is then fed by a hot-air blast, not dissimilar to that of the hot-air blast employed in smelting furnaces. The air thus heated not only promotes the combustion of the oil, but prevents distillation from taking place within the bulbs which inclose the wick, and therefore the source of unpleasont odor is removed. This new lamp may be moved quickly from place, and even swing about, and absolutely upset without danger, and with the production of far less smoke than is given off by a lamp burning sperm oil. It is as readily lighted and extinguished as a candle, and there is no odor from the burning oil. It burns kerosene, coal, petroleum, and other distilled oils. The specific gravity of the oils used while the writer was examining the lamp, was 0·805. The light is mild and agreable to the eye, and resembles the light given by sperm or rape-seed oil.

Besides the common table lamp, and burners for chandeliers, a small Acamine burner was observed; it is made for hand or portable lamps common in hotels. Taken altogether, Mr. Racey has proved himself to be a successful inventor, and will doubtless reap the reward of his science and ingenuity.

ABRAHAM GESNER, M. D., Chemist.

NEW YORK, Sept. 12, 1860.

The Acamine lamp may be seen at the office of Horatio Eagle, No. 254 Canal street, where it has been for several days on exhibition.

REBUILDING THE AUBURN N. Y. GAS WORKS.—The growth of the city of Auburn, and the increase of its population, demands the improvement and extension, among other things, of the facilities for supplying gas for lighting purposes. As the old Gas Works had become inadequate to the increasing wants of the city, and they were becoming somewhat the worse for wear, it was considered better economy to replace them with new and enlarged structures, than to make additions to the old ones. Contracts have been let for building the new works, on enlarged and elegant plans, and they will be pushed vigorously forward to completion by the middle of October.

The new gasometer is to be forty-four feet in diameter, and the contract for its contruction, together with the other necessary wrought iron work, has been taken by Siddons & Co.

YORKVILLE, S. C.—The new gas works at this place were lit up on Monday evening, August 6. Messrs. Waterhouse and Bowes are the builders, and the people of Yorkville say they have fulfilled their promises to the letter. Messrs. W. and B. are about erecting works also in Greenville, S. C., owing to the high terms in which the citizens of Yorkville speak of them.

MORE NEW GAS-WORKS UNDER WAY.—Mr. E. A. Coen, is building Gas-Works at Port Jervis, Orange County, N. Y. If Mr. Coen does as much justice to these works as he did to those at Jackson, Mich., he will deserve great credit. The Jackson Works are paying ten per cent. per annum dividend, and are reported to be entirely satisfactory.

PURE BENZOLE FROM COAL NAPHTHA.

The sulphite of phenyle and ammonium ($C^{12}H^5NH^4 2SO^2$), usually called sulphobenzolate of ammonium, yields a very large proportion of benzole when submitted to dry distillation. The hydro-carbon thus procured can hardly be distinguished from the benzole obtained by heating benzoic acid with lime. Its odor is ethereal, almost fragrant; and its boiling point is constant at 80°8. A chemist well acquainted with the ordinary benzole obtained from coal naphtha, to whom I showed a specimen of the benzole thus prepared from the sulphobenzolate of ammonium, scarcely recognized it as the same substance, so pleasant was its color. To prepare the sulphobenzolate, the purified benzole of commerce is dissolved with the aid of a gentle heat, in a slight excess of fuming sulphuric acid; if ordinary oil of vitriol be employed, a much larger quantity of acid is required. The acid liquid, after having been heated in the water-bath for some time, is allowed to cool, and then diluted with water. Commercial carbonate of ammonium, together with some ammonia water, is to be added till the solution is slightly alkaline. The whole is now evaporated to dryness in the water-bath, and the dry mass exhaused with boiling alcohol. The greater part of the sulphate of ammonium remains in the residue. The alcoholic solution of the sulphobenzolate of ammonium is to be transferred to a retort, and submitted to distillation. When all the alcohol has distilled over, the receiver is changed, and the heat raised. The benzole which collects in the receiver is accompanied by small quantities of solid products and by water. From these it may be separated by the addition of a strong potash solution, and the removal of the supernatant oil by the pipette. The benzole is then rectified off caustic potash. The benzole thus produced is perfectly pure, and although the quantity obtained is not very large, yet the result of the process is exceedingly interesting to the chemist, since it removes all doubt concerning the identity of the benzole from coal naphtha and similar sources with that obtained from benzoic acid.

ON THE VARIOUS MODES ADOPTED FOR COLLECTING SUPPLIES OF WATER.

The sources from which water is commonly procured have, in reality, only one origin; namely, the supply given by nature in the form of rain and snow falling from the clouds. The water thus bestowed may be seized by man in various forms. It may be taken in a comparatively pure, distilled state, as it falls in the shape of condensed vapor from the clouds, free from admixture with any earthy salts, or infusion of any other ingredients except those which it meets with in passing through the air. It may be collected from drainage areas, where the quantity of rain happens to be greater than that which evaporates and sinks into the earth: again, it may be taken from rivers, streams, or lakes, which are themselves supplied chiefly from drainage areas: or, lastly, it may be taken from wells or springs, where the water has accumulated after passing through strata and rocks of various kinds, and become much changed from its original state of purity by the absorption of gases and by holding in solution earthy salts and other bodies which it has met with in its subterranean passage.

With respect to the first or primitive state of water, however well adapted this may be, from its quality of softness, for certain commercial and culinary purposes, it is confessedly not palatable for drinking. It fails entirely in that agreeable taste imparted to spring water by the gases, and even by the mineral matters held in solution. At the same time pure rain water is so valuable for many purposes, and would answer so well for many others where quality is of no consequence at all, that the inquirer may at first sight ask with some surprise, how it is that means are not taken to collect the rain water as it falls from the clouds instead of extracting it often by a difficult and expensive process from the bosom of the earth. Let us examine this question a little more in detail. It is evident, until mankind had made considerable progress in the arts, there were no roofs of houses or other buildings from which rain water could be collected, and therefore if any attempt were made to procure it otherwise than by embanking across valleys, and collecting a certain portion of the rain fall, as practised at the present day, it must be done by making an artificial impervious surface, from which the water, falling in the shape of rain, could flow into cisterns placed to receive it. Let us suppose an acre of surface so constructed: the expense of doing this at the present day would probably be not less than $1,250 an acre, independently of the value of the land. Now the interest of this sum alone would be more than the value of the water which could be collected on an acre of surface, assuming an available rainfall of 30 inches, which is probably as much as could be obtained in dry years on the average, after deducting such evaporation as would be unavoidable in spite of all precautions. The whole quantity of water which could be collected on an acre of ground, from an available rainfall of 30 inches per annum, is under 681,000 gallons, which, at sixpence per thousand gallons (a price at which water can not only be collected, but conveyed and distributed in towns, even where pumping to a high level is necessary), would amount to little more than $90, or about the interest of the money to be laid out in constructing the gathering ground and purchasing the land alone. So much for the collection of perfectly pure rain water by an artificial surface. But it may be said, we possess in the roofs of houses already built in every town, the means of collecting rain water of tolerable purity, except when the atmosphere is polluted by smoke, as in the metropolis. We shall find, on examination that the quantity which could be so collected is wholly inadequate for the wants of any given population. Let us assume that the roof-surface of any town or large group of houses is equal to 60 square feet for each individual, an assumption which is probably much in excess of the real fact, then the annual quantity of water which would be collected on this surface on the same supposition as before, with respect to available rainfall, would be 935 gallons, or less than 3 gallons a day for each individual. Now the common allowance for towns in England, including every kind of use, both domestic and public,, is not less than 20 gallons per head per day, so that the rainfall alone will only give one-seventh of the quantity actually required; or, in other words, in order to obtain the required quantity we must assume an annual rainfall of 140 inches, which is scarcely yielded in any part of the world.

Professor Leslie calculates, in his Elements of Natural Philosophy, that a roof of a lofty house in Paris, containing on an average 25 persons, might deliver annually 1,800 cubic feet of rain water, which would furnish to each individual daily the fifth part of a cubic foot, or rather more than one gallon.

We find, however, notwithstanding the inadequacy of the quantity, that Venice and many other continental cities have been for many years supplied with rain water, both from public and private reservoirs, which are commonly constructed underground, for the purpose of receiving the water from the roofs. Matthews, in his Hydraulia, describes one of these public reservoirs, which is situate under the court of the ducal palace at Venice. Here the underground cistern is provided with a sand filter, through which the water passes, and flows into a covered well in a clear and transparent state.

In speaking of a surface to collect rain water from which surface it is to flow into a reservoir, it may be necessary to notice, in passing that such a precaution for a reservoir is necessary, in order to prevent the loss of all the water by evaporation. For instance, if a man were to make for himself a tub or cistern large enough in surface to catch all the rain water he required for his own use, calculating its area simply from the known rainfall, he would find that evaporation would carry off all the water as fast as it falls and a great deal faster. From the very accurate observations made at the Highfield observatory, near Nottingham, during last year, we learn that, whilst the whole rainfall was only 17.3 inches, the evaporation was equal to 41 inches, or more than double the amount of rainfall. As, however, the evaporation is in direct proportion to the area of the surface exposed, it follows that the rainfall of a very large drainage area may be collected in a small and deep reservoir with a comparatively small loss from evaporation.

ARTESIAN WELL AT MANCHESTER, ENG.—The greatest bore of any Artesian well in the world is said to be that just completed in Birmingham, England. The diameter fixed was the unprecedented one of twenty-six inches, and was accomplished by new and improved machinery. The machine thus employed is described as consisting of a very heavy bar of cast iron armed at its lower end with a number of cutting chisels, and suspended by a rope, which was in connection with a steam engine at the mouth of the well. As it is wrought up and down by the engine, the tension of the rope gives a circular movement to the bar of iron sufficient to vary the positions of the chisels at each stroke of the instrument. The apparatus of some well-borers has around the chisels a cylindrical chamber, which, by means of single valves, receives and retains the abraided portions of the rock. This chamber, which would not hold many pints, had, of course, to be raised to the surface at short intervals for the purpose of being emptied of the *débris*, thus involving much loss of time. But, by means of the improved machine, this operation is performed in a very different way. A cylinder is employed, eight or nine inches in diameter, having a piston fitted to it so as to form a pump, with one valve at the piston and another at the bottom of the cylinder. When the pump sinks to the bottom of the well, the piston, by its own gravity, sinks also to the bottom, and suddenly reversing the engine and drawing up the sucker, not only is the crushed *débris* drawn up, but also pieces of rock, six or eight inches in diameter. By this means six or seven tons of matter are drawn up per hour.

WILKESBARRE, PA.—Works built by S. R. Dickson & Co. Iron retorts of Merrick & Co. used, and Gratz's meters. Pittsburg coal is carbonized—cost $5 per 2000 lb. About 6 miles mains laid, of from three to 6 inches diameter. Down's wet meters are mostly in use.

PALMYRA, N. Y.—Gas-works on the Aubin principle; reported to be entirely satisfactory. Use D. McDonald & Co.'s meters, Deily's gas-holder. Length of mains two miles, from two to four inches diameter.

PETERSBURG, VA.—Works built by Perdicaris & Hoy. Retorts iron, from Merrick's foundry; meters of Gratz's make. About ten miles of mains are laid, from two to eight inches diameter. Virginia bituminous coal is used, costing 13½ cents per bushel of 70 lb. Meter rent from $2 to $4 per annum.

PORTSMOUTH, VA.—Works built by Perdicaris & Hoy, supplied by Merrick & Sons' iron retorts and Gratz's meters. Six miles of mains laid from two to eight inches diameter. Fry Clover Hill coal, delivered at works at 18 cents per bushel. Meter rent $1 50 per annum.

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is specially devoted to

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, and DRAINAGE everywhere.

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DOMESTIC.

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THE
AMERICAN GAS-LIGHT JOURNAL.

ISSUED SEMI-MONTHLY.

SATURDAY, SEPTEMBER 15, 1860.

Cheap gas is now the popular cry both in this country and in the older countries of Europe, and numerous are the methods which have been proposed for its realization. In England, legislative interference has several times been attempted, and a law has just been passed which, in its original form, and before being modified by wiser counsels, was neither more nor less than a confiscation of property belonging in equity and justice to existing companies. In France, the attempt to cheapen gas has taken another and less mischievous form, and has led to the invention of numberless ingenious methods both for making and for consuming this important article in a more economical manner. The carburation of gas is a plan recently proposed there, for enriching gas with illuminating elements, and if the union could be rendered more permanent and less sensitive to condensing influences, the expedient would have great value, and could not but be widely adopted.

In this country the case is somewhat analogous. Upon legislation we cannot rely for the performance of functions so far removed from its legitimate sphere, and we should justly regard as mischievous, offensive, and intolerable, any attempts to regulate in this way the price either of illuminating material or of any of the other necessaries of civilized life. In a nation so celebrated for its inventive genius, and which, during its brief existence, has given to the world the sewing machine, the cotton gin, the electric telegraph, and many other magnificent improvements and valuable discoveries, it was not to be expected that the necessity of more scientific and economical arrangements for the manufacture and consumption of so important and so much used an article as illuminating gas would fail to attract the attention of gifted and enterprising minds. In this city, at the present moment, we believe there are at least a dozen different methods, more or less perfect and mature, which are in operation for the manufacture of gas. In these different apparatus various kinds of hydro-carbonaceous materials are employed. and the arrangements that we have seen in some are as beautiful in contrivance as the results are satisfactory to the contrivers. The different kinds of burners are also very numerous, and some of those on exhibition in the Rooms of this JOURNAL effect no small saving.

The adjusting of the pressure on the burners at the moment of combustion, has also attracted much attention, and since a large proportion of gas has been proved to have been saved by the use of regulators, a number of mechanical contrivances for this purpose have been invented, some of which possess unquestionable merit. As an illustration of the value of gas-regulators, we may mention that during the past year, several of these adjusting instruments were placed for trial in the City Hall, and Fulton Market, in this city. The following table will show the saving effected in consequence, during the three months, ending May 1st, 1860, over the corresponding time of last year:

	Feet.			
	1859.	1860	Decrease.	
City Hall.....	150,600	89,900	60,700	$151,75
Fulton Meat Market.....	122,000	86,500	35,500	88 75
" Fish Market.....	29,800	27,200	2,600	6 50

There was no decrease in the number of burners in the above places, or in the number of hours burning. The flickering and blowing of the lights, caused by the difference in pressure, entirely ceased, and a steady, uniform light was given, and as the above saving was much more than the price of the regulators, the Superintendent of the Department recommended that those in use should be purchased, and that in the public buildings, where a large quantity of gas is consumed, the regulators should immediately be placed therein.

It is not, however, our purpose to multiply examples illustrative of the importance of the rapidly increasing methods of economizing in the use of gas. We will only say that in the present temper of the public mind, thatthere is no doubt that any well devised and superior contrivance for securing this object, whether it be an improvement in gas burners, gas regulators, or in any other apparatus, will infallibly secure to the inventor an ample reward.

We may also add, that our arrangements in this office, are such as to afford special facilities and advantages to any parties who wish to secure patent rights for any inventions connected with LIGHT, HEAT, WATER-SUPPLY and SEWERAGE, which important subjects are our specialty. It will also afford us much pleasure, at all times, to afford any aid which our experience and knowledge can render to parties having any such mechanism or invention in progress, as we know that by obtaining competent assistance, at an early stage, considerable losses, both of time and money, are frequently prevented.

PATENT EXTENSIONS.

IMPORTANT DECISION BY THE COMMISSIONER OF PATENTS.

We learn that the Hon. PHILIP F. THOMAS, Commissioner of Patents, after a full and careful examination of the application of ELIAS HOWE, Jr., for an extension of his sewing machine patent, and of the arguments adduced by the opponents of the application, has decided in favor of the applicant, and has extended the patent to a further term of seven years. Mr. HOWE is truly a fortunate man. It is estimated, by those who are competent to form an accurate judgment, that the aggregate amount of his royalties for the next seven years, will be at least $1,000,000, and probably double that sum. But the benefit derived by Mr. HOWE from the extension of his patent, large as it is, is insignificant in comparison with the advantageous effect of the Commissioner's decision upon the interests of inventors and the public generally.

The Commissioner has boldly reduced to practice a rule of judgment, hitherto not much more than recognized by his predecessors in office, viz.: That "a reasonable remuneration for the time, ingenuity, and expense bestowed upon his invention" by the inventor, means, a remuneration commensurate with the value of the invention to the public.

The Commissioner has furnished us with a brilliant example—Mr. HOWE's admitted profit being $468,632.31. By extending this patent, the Commissioner virtually and practically decides that no compensation, however large, is a "reasonable remuneration" that is not commensurate with the value of the invention to the public.

This is the final act needed on the part of the public to complete the full and entire recognition of the rights of inventors to a just reward for their inventions.

It will now be understood that "reasonable" has some other meaning than "small," or "cheap;" words or ideas too often associated in the public mind with the guerdon of inventors.

This decision will have greater effect to stimulate the genius of American inventors than anything that has occurred since the adoption of the patent laws. The intelligent public will readily foresee the beneficial results that will surely follow such stimulus to invention in a nation which, under adverse circumstances, has already produced FULTON, WHITNEY, MORSE, MCCORMICK, and HOWE.

The present Commissioner of Patents evidently possesses enlarged and liberal views, and is rapidly becoming as deservedly popular throughout the Union, as in Maryland, his native State, of which he was formerly Governor.

LIGHT! LIGHT!! LIGHT!!!

Inventors attend! We must have more light. There is at present no field that offers to inventors a broader scope and more brilliant success both as to fame and profit, than light.

New illuminating substances are being daily developed, which call loudly for the invention of suitable devices for burning them.

The inventor who first perfects a small hand lamp that will burn coal-oil from the wick, without a chimney, and without smoke or smell, is sure of an independent fortune.

TABLES OF BRITISH GAS-WORKS.

Our next number will contain the statistics of British Gas-light Companies, compiled from official sources, of which we shall print an extra edition of several thousand copies to meet the demand that exists here to know what is doing on the other side in gas. News agents will send in their orders early, as we have adopted a rule to preserve complete a few thousand copies of the JOURNAL for the purpose of binding, and will not sell any number that may destroy a set.

BUSINESS DEPARTMENT.

MESSRS. LANE and ANNIN advertise a new gas-meter stop-cock which can be attached to lead pipes without solder. This is a new and important improvement, worth the attention of gas fitters. This firm are largely engaged in the manufacture of gas and steam fittings generally.

Mr. JAS. M'GLENSEY, No. 111 South Eighth street, Philadelpbia, advertises his patent gas burners of which samples are at our rooms. They are intended to lay on the (soft) solder, curl hair, assist book-binders, chemists, and the rest of mankind.

Mr. H. P. GENGEMBRE directs public attention to his gas-meter fluid. We used this fluid in our own meter last winter, and find it to have no injurious effect upon it. PROFESSOR H. BUSSAUCE, of New Lebanon, N. Y., has two advertisements in the JOURNAL which will interest a large class of manufacturers and others, especially those who require chemical examinations and analyses.

POTTS' REVOLVING SIGNAL LIGHTS FOR STEAMERS.

We direct the attention of owners and masters of steamers to the description and engravings on the last page, of Mr. Albert Potts' system of Revolving Signal-Lights, by means of which a continuous and intelligible conversation can be carried on at sea between any number of steamers. We have at these Rooms a full-rigged steamship of-the-line, manned, armed and equipped, built expressly for, and presented to us by Mr. Potts, to illustrate this system. The SIGNAL LIGHT, for such is her name, is a full-rigged side-wheel steamer of-the-line, 56 inches in length, 13 inches beam, 12 inches depth of hold, has three masts, and is propelled by two horizontal low-pressure engines of about three-kitten power each, when the full force of the boiler is applied. Her armament consists of 12 guns on the main deck, with a heavy concealed battery below. Her cabins are furnished throughout in luxurious style, and on her deck are officers and men in full uniform, with all the "pomp and circumstance of war" surrounding. Attached to her wheels are the signal lights, which revolve when the steamer is in motion, and the ease with which one or both can be revolved, reversed, thrown out of gear and stopped, is as interesting as it is ingenious. This invention is of the utmost importance to the shipping interest, and we shall have the steamer in full operation on some evening, for the purpose of exhibiting it to Commodore Vanderbilt, Edward Cunard, Esq., and others identified with the shipping interest.

REPORTS OF GAS-LIGHT COMPANIES.

PITTSBURG, PA., GAS COMPANY.

We are favored with the annual report of this company, signed by Thomas Bakewell, Esq., President, together with that of the engineer, James Thomson, Esq. It is dated July 31, 1860, and is quite full and intelligent:

Total length of mains laid to July 1, 1859,		137,200 ft.
Laid since that date	20,368	
Loss replaced by larger pipes	2,385	17,983 "
Total length of pipes laid 29 4 10 miles, or		155.183 ft.

Coal carbonized during the year, 209,928 bushels; gas distributed to public lamps, various; city offices and private consumers, 68,139,213 cubic feet, being an increase over last year of 5,967,551 cubic feet, averaging 324 cubic feet of gas for each bushel of coal carbonized, without making any allowance for leakage, waste, or condensation, which it is believed has not exceded 6 per cent. Average number of retorts in use (clay or iron?) during the year, 33, the largest number being 45; there are in the two retort houses 30 benches, capable of containing 90 retorts, which, if in full operation, would make an average product of 600,000 cubic feet of gas *per diem*.

Services laid since last report, 201. Total in use 2,825. New street lamps set, 31. Total in use, 548.

Coke and tar continue in good demand at fair prices.

Average number of hands employed at the works, 43.

During the last Session the Legislature authorized the surrender of the stock held by the city, upon terms mutually advantageous, which were shortly afterward ratified by the City Councils, and accepted by the stockholders. The provisions secure an annual supply of gas for the public lamps and city offices, abundant for ordinary consumption, free of charge, with a very low rate for extraordinary demands, and further provide that the price to be charged to individual consumers shall never exceed the present rate. The number of Trustees was reduced to nine, the Stockholders were empowered to increase the capital stock of the company, so as to meet the increased expenditure for gas mains and other necessary purposes, the debt owing by the city to the company for public lamps was cancelled, and other amendments were introduced with a view to the protection of the rights both of the citizens and the company.

Although these accounts are rather long for our space, yet we deem it a benefit conferred upon the gas works of the country to present them as intelligible statements worthy of imitation, and we accordingly print them in full.

MANUFACTURING EXPENSE.

DR.

To Stock on hand		4,217 82
Wages	22,706 26	
Retorts and Castings	2,218 25	
Wrought Iron and Nails	127 80	
Coal and Slack	11,882 25	
Lime	749 57	
Lead, Oil, &c	132 02	
Printing Reports, Books, &c.	159 03	
Hay, Oats, Harness and Horse shoeing	210 78	
Taxes	2,044 94	
Water rent	491 15	
Insurance, Discount and Interest	162 68	
Lumber	45 55	
Hardware and Tin Work	120 52	
Wire and Riddles, $27 73; Muslin, $27 41	55 14	
Sand	65 69	
Chloride of Calcium	456 91	
Fire Bricks and Clay	79 10	
Ice, $12 20; Cordage, $4	16 20	
Horse	170 00	
Paving Diamond street and sidewalk	89 35	
Cherry alley sewer, assessments and cost	12 12	
Belting and Hose	44 77	
Patent for Meter Fluid	1,000 00	
Law expenses	225 00	
Repairs to Works	8,013 74	
Petty Cash	906 90	
Salaries	3,600 00	55,785 60
		$60,003 48

CR.

By Stock on hand	7,119 15	
Cash for old material	71 93	
Lloyd & Black for scrap iron and castings	474 22	
Sundry persons	1,045 00	
Profit & Loss	51,293 18	
		$60,003 48

PROFIT AND LOSS.

DR.

To Dividend No. 25, Jan. 1860, five per cent.	15,000 00	
State Tax on same	750 00	15,750 00
Dividend No. 26, February 1860, 5 per c't.	18,980 00	
State Tax on same	949,00	19,929 00
Manufacturing Expense, as per account	51,293 18	
Services, for balance of account	723 60	52,016 78
Works, for wear and tear	3,467 15	
Distribution, for wear and tear	2,690 75	
Fittings rented, for wear and tear	48 53	
Meters, for worn out and unserviceable	1,487 89	7,694 32
Public Lamps, for balance of that account,		3,370 75
Scrip Certificates of Stock		79,600 00
Porter, Rolfe & Sweat, for balance of acc't.		115 59
City of Pittsburg, for 6,008,991 cubic feet of Gas, consumed in six months, up to date		4,506 74
Dividend, No. 27, July 1860, $2 per share,	15,170 00	
State Tax on same	759 20	15,929 20
Balance		5,281 56
		$204,193 94

CR.

By Gas for 54,642,800 cubic feet to private consumers, less discount and loss	82,899 02	
Gas, for 6,207,186 cubic feet to Public Lamps, Mayor's Office, Watch House, and Water Works, from July 1st, 1859, to December 31st, 1859	5,939 75	
Gas, for 6 008,991 cubic feet to Public Lamps, Mayor's Office, Watch House, Water Works and Market Houses, from January 1st to June 30th, 1860	4,506 74	
		93 345 51
Coke and Tar, for proceeds	9,310 16	
Fittings rented, for proceeds	135 00	
Fittings for proceeds	937 02	
Meters, for proceeds	659 75	
Rents of Real Estate, for proceeds	120 00	
Cash, for interest on County Warrants	14 14	
		11,176 07
Extension Fund, for amount of that acc't.		79,208 14
Contingent Fund, for amount of that acc't.		20,464 22
		$204,193 94
Balance		5,281 56

BALANCES.

DR.

To Works	169,890 44	
Distribution	104,939 34	
Real Estate	54,810 72	329,640 50
Extension Fund, since 1st Jan. last		1,308 20
Meters		13,391 10
Fittings rented		436 84
Stock on hand		9,401 40
Bills Receivable, City and County Warrants,		5,070 93
City of Pittsburgh		728 63
Sundry persons		6,944 90
Bank of Pittsburgh		1,000 00
Cash		36.050 16
		$403,972 66

CR.

By Capital Stock	379,600 00
Commonwealth of Pennsylvania	2,458 20
William Hodgson	1,462 90
Profit and Loss	5,281 56
Dividend No. 27	15,170 00
	$403,972 66

COAL IN THE UNITED STATES.

The coal trade of the United States is every year extending in a ratio of increase that is truly encouraging, and yet in comparison with the vast riches remaining undeveloped, and the greater promises of the future, it may be said to be still in its infancy. There are few who can think of the immense fields of coal already discovered beneath the surface in America, Europe, and some parts of Asia and Australia, without at once reverting to the question, how came this supply of fuel to be garnered in its secret chambers? In answer, it is now universally conceded that all the coal beds, both bituminous and anthracitic, are of vegetable origin, and the most probable theory is that which ascribes them to submerged forests, or other vegetable deposits, which, pressed down into compact masses, and passing through the intermediate state of peat, became gradually consolidated into coal. The character of the vegetation can be easily traced by the quality of the deposit, and shows even a greater variety than that now growing upon the earth's surface. This vegetable origin is now readily detected in all the formations, more than four hundred different varieties of plants, trees and shrubs having been discovered, a number of which are now extinct. Some coal beds appear to have been formed from grasses, shrubs and the shed foliage of trees, not a structure of any size being traceable in the mass; as if the leaves and waste foliage of a forest had gradually accumulated in a basin or lake, where the deposit had undergone a process of fermentation by which vegetable substances are changed to a carbonaceous mass similar to the peat bogs; and then by some mighty convulsion of nature it had been subjected to a tremendous pressure, which gave it a new form and character, and preserved it for the subsequent ages. In other formations the traces of forests are distinctly visible. The huge trunks of mighty trees, supposed to be without a parallel on the earth until recent discoveries on the Pacific coast have almost matched them, can be found spread out in all their gigantic proportions, except that the cellular tissues seem to have been partially closed by the enormous pressure. Science has brought this investigation to such a point of exactness, by sawing the coal into thin layers and oiling the surfaces, that even the names of the several trees can be readily given, and the pine, the birch, &c., can be pointed out, with the very shape of the trunk and branches, and the size and location of the roots running down into the earthy matter below the clear mass. Not only this, but even the annual rings, marking the growth of the tree, can be pointed out in many specimens, and one geologist reports the discovery near Bonn of a fossil trunk containing 792 of these annual circles!

The anthracite coal has evidently been subjected to a greater heat during its formation than many of the lighter qualities, and the vegetation seems to have been decomposed by a different process, while it was mixed with argillaceous and other earthy substances; but there is a strong probability from the similarity of the geological attendants, that the change took place with each at about the same period. Most geologists are now agreed that the anthracite, semi-anthracite, and bituminous coal, were originally of precisely the same character, but that the anthracite has since been subjected to heat, discharging the bitumen: while some maintain that the change is still going on, and that after the lapse of ages all the bituminous would in the end become anthracite. Several things appear to be well established in regard to these deposits. The vegetable growth on the earth's surface which formed their foundation, was of extraordinary abundance, and at or about the time of the change this mass must have been completely saturated with, or totally submerged in water, the coal being found imbedded in alluvial deposits, or coated with such tokens, as clay hardened to slate.

Some of our readers who are still in the prime of life, may remember the ridicule which was thrown upon the early attempts to burn the "stone coal," as the anthracite was called on its first introduction. Without the means of close confinement and strong draught of air, ignition was a tedious process, and the attempt sometimes totally failed, when the venders of the fuel were anathematized in the strongest terms. The invention of cylinder stoves soon changed the public estimate of its character, but for a long period the early experimenters remained totally incredulous in regard to its value.

We have said that the coal trade in this country is yet in its infancy. A few statistics will establish this more fully. The coal fields of the United States are covered by an area of nearly 150,000 square miles, while in Great Britain the extent is only 11 859, in Spain, 3,408, in France 1,719, and in Belgium 518 square miles. Now in Great Britain the annual production of coal is over 40,000,000 tons, and even in Belgium about 7,000,000 tons; while in the United States, the last annual yield was only 7,517,516 of anthracite, and 1,091,063 of other descriptions! With a coal area twelve times greater than that of Great Britain, our annual production has now reached only one-sixth of hers, a disparity due to the fact that this is a new country, still abounding in wood, while the facilities for mining and delivering coal are of comparatively recent introduction. As we intimated, however, the work is steadily progressing. In 1820 but 365 tons anthracite were sent to market; in 1859 the quantity had reached 7,517,516 tons, which was also a gain of 1,026,329 upon the previous year. The bituminous and semi-bituminous coals have made less rapid progress; in 1842, of this class 1,708 tons were forwarded; in 1859 the total was 1,091,063, of which 697,466 came from the Cumberland mines. It is probable that no industrial interest in this country will show so large a gain during the next ten years as that connected with the coal trade. This fuel has now become a necessity, and its use is increasing in an augmenting ratio, which may be checked by adverse influence, but cannot be overcome.

CHEMICAL ACTIVITY OF LIGHT.

The experiments of American and European investigators have, recently disclosed some beautiful truths respecting the laws of light, which will be of no small utility in agriculture, photography, and other arts. One point which is at present attracting some attention is the discovery of some exact method for the measurement and registering of the precise amount of force exerted under different conditions by the actinic rays of the sun. In photography, the establishment of accurate means of measuring the chemically active rays will be a step toward attaining a deeper knowledge of photo-chemical processes, of the nature and fundamental laws of which, notwithstanding the great progress of the photographic art, we know as yet so little. By the rise of the chemical photometer, the amount of actinic light which emanates directly from the sun, has already been measured with approximate accuracy. Repeated experiments seem to show that at two different times on the same day the rays contained in direct sunlight are capable of producing equal chemical effects. These periods occur when the sun is at the same height above the horizon, the sky being cloudless, Thus the chemical power of direct sunlight at 9 A. M., and at 3 P. M.; at 11 A. M., and at 1 P. M., is the same. The chemical action due to diffused daylight has also been subjected to similar measurment, and the amount produced at an equal distance before or after mid-day is found to be the same. These conclusions hold good only where the sky is free from clouds Photographers working in covered rooms which have various aspects, must naturally arrive at totally different results. The laws regulating the variation of the photo-chemical intensity of direct and diffused solar light with the hight of the sun above the horizon, afford us the means of arriving at several interesting facts. For instance, it appears that wherever upon the earth's surface the sun does not rise beyond a certain height, the actinic power exerted by the total diffused light is, during a part of the day, greater than that produced by direct sunlight. When the sun rises beyond this hight the direct sunlight has more chemical action than the total diffused daylight; and between these situations there is a time when the chemical energy of these two sources is equal. This point is called "the phase of equal chemical intensity." A simple and accurate method is much needed for registering the daily and yearly variation of chemical light poured from the sun over the earth. The science and art of photography would thus be advanced, and a novel and interesting field would be opened to meterological research, Dr. Draper, the professor of Chemistry in the University of New York, has made several highly important discoveries in this department of scientific investigation.

THE GREAT CROTON PIPE.

As the new main over the High Bridge, near this city, is one of the most interesting and important public works now in progress, and presents in itself and in its manufacture many features of novelty, we have taken some pains to gather the following facts in relation thereto. The tube is made of Baltimore charcoal pig iron, the plates for which are prepared at Horace Abbott & Son's, Canton Rolling Mills, Baltimore; a firm which has made the widest iron in the world, sheets 110 inches wide, by ¼ an inch thick, having been manufactured by them. The pigs of iron weigh about 100 pounds each. Several pigs having been broken up into three or four pieces each, as many as are required are thrown into the puddling furnaces, with an allowance of about 50 per cent. for loss of weight in manufacture. The mass soon becomes of the consistency of dough, when it is stirred up with slice bars, or puddling irons, very much as a woman would stir up the material for a loaf of bread. After the lapse of about an hour, it is worked up into what is called a puddle-ball, in this case of about 30 inches in diameter, and then by the aid of tongs and a crane is placed beneath a large Nesmith hammer, and after a tremendous pounding, it comes out in the form of a slab. 2½ feet long by 18 inches wide, and 6 inches thick. After being allowed gradually to cool off, this slab is put into a reheating furnace, where it remains a few minutes, and is then taken out and rolled to the required thickness, and the ragged edges trimmed off by means of large shears. The sheets prepared for this pipe are six feet wide by 8 long, and half an inch thick. The iron used is required to stand a strain of 40,000 pounds per square inch. The pipe is 1,350 feet long, and 7½ feet in diameter; the tallest man, therefore, would not graze his hat in passing through it. It will be made in sections of 12 feet. There will be 112 of these sections, requiring 675 sheets, each of which contains 48 square feet, and weighs 960 pounds, or 20 pounds to the square foot.

The first thing done at the shop of Sneden & Rowland, the contractors, is to lay the sheets out perfectly square, and make the edges fair and smooth. Going then to the punching machine, each sheet is punched near the edges with 200 holes, 13-16 of an inch in diameter. The sheets are then put under a drilling machine, and each hole is countersunk so that the rivets may be driven flush, leaving the pipe perfectly smooth on the inside. Indeed it is affirmed that it will be very difficult to distinguish them. Next the sheets are sent to the rolling machine, and rolled to the required curve or radius, three sheets butted together forming the pipe. In order to make this butt-joint, a strap of iron nine inches wide and half an inch thick is employed, which runs the whole length of all the seams. These straps are made of flange iron, which is required to stand a strain 50 per cent. greater than that used for the sheets. The heads of the rivets are outside of the straps, which again, of course, are outside the pipe. The rivets are made by Burden, at the Troy Iron Nail Works, and are three-fourths of an inch in diameter and 1⅛ inches long; the head of the rivet is 1⅜ inches in diameter. In each 12 foot section there are just 1,200 rivets. The weight of the plates is 648,000 pounds; of the straps, 145,125; of the rivets, 50,000—making in all a total of about 840,000 pounds. The contract of Abbott & Son, for furnishing the plates and straps was for $28,859 81. Sneden & Rowland do the remainder of the work, and supply the other materials for $29 31 per linear foot, amounting to $49,260 50. Total, $78,120 31. Exclusive of this, there is a large job of mason work in raising the parapets of the bridge an additional seven feet, and an iron roof is to be placed over the whole for protection. Each section will be complete in itself when sent from the shop. They will be transported the whole distance by water in lighters. At the High Bridge they will require to be hoisted 125 feet for which purpose an ordinary boom derrick will be used, to be operated by a steam engine of 20 horse-power. The derrick and engine will be on the top of the bridge. Upon the copings of the bridge a track will be laid, on which a car will be run for the purpose of carrying each section of the pipe to its proper place.

The new main will be placed a couple of feet above the two pipes now in use, which lie parallel to each other, are three feet in diameter, and are made of cast-iron. It is calculated that the new pipe will conduct a volume of water about three and one-fourth times greater than the two old pipes together, which if we recollect rightly, discharge 40,000,000 gallons daily. The new pipe will rest on about 170 cast-iron standards, or saddles, which are placed eight feet apart, and weigh about 1,000 pounds each. It will be protected inwardly and outwardly by coatings of Prince's metallic paint.

The estimated difference in the length of the pipe in summer and winter is four inches; and to provide for this expansion and contraction there will be a slip joint at either end, which will be made of cast iron, with slipping surfaces lined with brass, to prevent their becoming fixed by oxydation. For this 600 pounds of brass will be required. There will be four man-holes, at intervals, on the top, each 16 by 18 inches, for the purpose of getting into the pipe to clean or paint it. The pipe is mounted on rollers, otherwise this same contractive and expansive power would prove destructive to all the surroundings. In regard to the strength of the pipe, it is claimed that, if supported at its extremities, with 1,350 feet intervening between the supports, it will sustain itself when filled with water. By a wise forethought, the old pipes will remain on the bridge, and can at any time be brought into requisition in case of accident to the new one. The whole arrangement reflects great credit upon Mr. Craven, the Chief Engineer.

Out of the 675 sheets, 104 are already in Sneden & Rowland's shop, and active operations have commenced on the work. The sections will be taken to bridge as fast as they are completed. It will probably take till the 1st of January to rivet together the pipes, and a still longer period before the Croton can avail itself of this new and more liberal channel. The old pipes are uncovered, and if the Mayor continues his objections to the construction of the masonry necessary for their protection, the Croton Board will be obliged to put up a temporary roof, sufficient to keep away the frost.

HISTORY OF BALLOONING.

[*Continued from page* 43, *Vol. II. of the* AMERICAN GAS-LIGHT JOURNAL.]

CHAPTER III.

We have shown on page 9, Vol. I., of this JOURNAL that inflammable gas is co-eval with the creation, and that no such person as the discoverer of gas ever existed, unless, indeed, it may have been Eve, when she listened to the serpent, in which case she "discovered" it to her sorrow—and ours. On the page above mentioned, it is stated that in 1667 natural gas was discovered issuing from the coal beds in Wigan, England, and Wise, from whose excellent work we continue to quote, says that in 1776 the properties of hydrogen gas were first made known by Mr. Cavendish, as will be seen by reference to the Philosophical Transactions of that period. Tiberius Cavallo says: Soon after this discovery of Mr. Cavendish, it occurred to the ingenious Dr. Black of Edinburgh that a vessel might be made, which, when filled with inflammable air, might ascend into the atmosphere, in consequence of its being altogether lighter than an equal bulk of common air. This idea of the Doctor had been frequently mentioned, but he himself wrote a candid account of it to Dr. James Lind, physician at Windsor: and here follows part of the letter:

EDINBURGH, Nov. 13th, 1784.

"DEAR SIR: The person who first discovered with exactness the specific gravity of inflammable air was, as far as I know, Mr. Cavendish. I never heard of any experiments made with that intention, before his appeared in the Philosophical Transactions for the year 1766. It had been my constant practice before to show, every year, in what manner it burns when pure and unmixed with air, and how it exploded when air is mixed with it before it is fired; but Mr. Cavendish made a variety of such mixtures by rule and measure, and describes in the same paper the manner in which they severally exploded. As soon as I read the above paper, it occurred to me, as an obvious consequence of Mr. Cavendish's discovery, that, if a sufficiently thin and light bladder were filled with inflammable air, the bladder, and the air in it would necessarily form a mass lighter than the same bulk of atmospheric air, and which would rise in it; this I mentioned to some of my friends, and in my lectures, the next time I had reason to speak of inflammable air, which was either in the year 1767 or 1768; and, as I thought it would be an amusing experiment for the students, I applied to Dr. Munro, dissector, to prepare for me the allantois of a calf. The allantois was prepared, but not until after some time had passed, and when I was engaged with another part of my course, and did not choose to interrupt the business then going on; so I dropped the experiment for that year, and in the subsequent years I only mentioned the thing as an obvious and self-evident thing, from Mr. Cavendish's discovery; but, finding generally some difficulty in providing an allantois at the proper time, I never made the experiment which I considered as merely amusing. About two months ago, I was informed by a gentleman in the south of Ireland, that he had tried it, and that it succeeded perfectly well."

These circumstances are related by some writers to show that the principle of raising aerostatic machines had been discovered before the experiment was made by the brothers Montgolfier. Tiberius Cavallo introduces this letter of Dr. Cavendish's in an article wherein he himself claims to be the first person who succeeded in raising balloons. He says, "The possibility of constructing a vessel, which, when filled with inflammable air, would ascend into the atmosphere, had occurred to me when I first began to study the subject of air, and other permanently elastic fluids, which was about eight years ago; but early in the year 1782, I actually attempted to perform this experiment; and the only success I had was to let soap-balls, filled with inflammable air, ascend by themselves rapidly into the atmosphere; which was perhaps the first sort of inflammable air balloons ever made. I failed in several other attempts of a like nature; and at last, being tired of the expenses and loss of time, I deferred to some other time the prosecuting of those experiments, and contented myself with giving an account of what I had done to the Royal Society, which was read at a public meeting of the society on the 20th of June, 1782."

Although M. Cavallo concedes the right of discovering the aerostatic machine, which first proved successful to the Montgolfiers, it is but due to his integrity and ability in philosophical pursuits to give his ideas in full upon the subject.

The following is a copy of the paper presented to the society by M. Cavallo. "It has been commonly believed that common air would not pervade the pores of paper, such as is used for common printing or writing; and, that paper is permeable to water, and not air, has been alleged by some persons as an instance tending to prove that some fluids have the property of passing through certain substances, and others have not; although the particles of the former are of a grosser, heavier, or more of a tenacious nature towards each other.

"Admitting, according to the common notion, this impermeability of paper to common air, and presuming that it was impervious to other permanently elastic fluids also, I determined to make use of paper for an experiment, which, though repeatedly attempted with other substances, had never succeeded. The experiment was to construct a vessel, or a sort of bag, which, when inflated with inflammable air, might be lighter than an equal bulk of common air, and consequently ascend, like smoke, into the atmosphere; it being well known that inflammable air is specifically lighter than common air.

"The weight of inflammable air, the mean weight of atmospheric air, and the weight of substances of which the vessels are to be formed, being ascertained, it is easy then to determine by calculation, the dimensions of a vessel which, when filled with inflammable air, would be lighter than an equal bulk of atmospheric air. In this manner, and for the above mentioned purpose, I tried bladders, the thinnest and largest that could be procured. Some of them were cleaned with great care, removing from them all the superfluous membranes and matter that could be possibly scraped off; but, notwithstanding all these precautions, the lightest and largest of these bladders being guaged, and the requisite calculations being made, it was found that, when filled with inflammable air, it would be at least ten grains heavier than an equal bulk of common air, and consequently it would descend, instead of ascending, in that element. Some swimming bladders of fishes were also found too heavy for the experiment; nor could I even succeed in making durable light balls by blowing inflammable air into a thick solution of gums, thick varnishes, and oil paint. In short, soap balls, inflated with inflammable air, were the only things of this sort that would ascend into the atmosphere; but as they were very brittle, and altogether untractable, they do not seem applicable to any philosophical purpose."

Thus, it is seen that, in the progress of over 2000 years, this science was gradually built up. Each succeeding generation adding to it the ideas and recommendations of its most ingenious artists. As an obvious truth, it naturally inspired the scientific of all ages to explore its feasibility to human convenience. As an acknowledged science and practicable art, it is yet destined to open to the civilized world a grand and expansive field of happiness. Those who contributed to its discovery deserve the attention of the historian; because their perseverance and indefatigable efforts, devoted to its development, are calculated to keep alive the energy of those who shall succeed them in endeavoring to improve its usefulness.

Although Mr. Gallien, in his book published in 1755, asserts in theory the very thing that was practically demonstrated by the Montgolfiers im 1782, and Tiberius Cavallo more than theorized the subjects by inflating soap bubbles, still it required much more than all these intimations and incomplete experiments to demonstrate to the world that the atmosphere was really navigable to human beings. Tiberius Cavallo did in reality approach nearer to a final discovery than any of his predecessors; but from his own words he makes it appear that little, beyond the partial success of his soap bubbles, was attained in his investigations. The necessary stimulus—realization of the theory, such as the experiment at Annonay—yet wanting, would have left the subject to slumber with the mysteries unrevealed, had it depended on his experiment alone, at least for a time to come.

The Royal Academy had the same inducements, in a merely philosophical point of view, to institute experiments to the ascent of bodies in the air, upon Cavallo's communications and those of Dr. Black, that they had on the information of the Montgolfiers' discovery. In short, the merit of any discovery properly belongs to the actual inventor, to him who first realizes the idea by putting it in practical operation, just as the Montgolfiers did with their balloons.

After the decisive experiment had been made by the aerial voyage of M. Pilatre de Rozier and the Marquis d'Arlandes, over the city of Paris, and in sight of all the people of that modern Athens, it naturally gave an impulse to the subject that operated more favorably on its progress and improvement than any mere theory or simple experiments could have given it for ages. It was the *experimentum crucis* of aeronautic science. The news of it spread like wildfire through every civilized nation on the earth. America not behind the rest, and with its Rittenhouse and Hopkinson, distinguished our nation, even on that subject, for the genius and boldness of its people.

Paris did not long remain alone the theatre of aeronautic experiments. In the following year a balloon of most extraordinary size was constructed in the city of Lyons. It was 130 feet high, and 105 feet in diameter. It lifted up over eighteen tons when the air was highly rarefied in it. On the 19th of January, 1784, an experiment was made with it. After the preliminary arrangements of preparing a fire-place over which to inflate it, and a frame on which to lay it, the inflation was completed in the short space of seventeen minutes. Seven aeronauts then took their station on and around the gallery of the balloon. Everything being now adjusted so as to keep this huge machine in proper trim, the rarefaction of the air within it being of such a pitch as to give it a tremendous ascending power, it was thus suffered to waft itself and passengers into the serene atmosphere above.

The effect of the ascension, as given by the accounts at the time, was astonishing in the extreme. The intense curiosity of the immense concourse of people present seemed at first completely paralyzed by the grandeur of its ascent; but, soon after, they broke out in the most intense and tumultuous shoutings. In seventeen minutes the balloon rose 3,500 feet high, which was ascertained from instruments expressly provided for the occasion.

Unfortunately for this magnificent machine, it was made of material of too frail a quality for so large a balloon, which caused it to give way when it was at the greatest height, making a rent of at least fifty feet. This caused the inclosed air to cool very suddenly, which brought the whole concern down with considerable rapidity. The passengers, however, all landed safely, having received not even the slightest injury from the accident.

In the month of February of the same year, a balloon was constructed at Milan. This was only sixty-eight feet in diameter. Three Italian gentlemen ascended with it, and made a very interesting voyage. They remained in the atmosphere for a considerable length of time, and managed to lower and raise themselves at pleasure by regulating the fire by which they kept up the rarefaction of the air in the balloon. They were eminently successful in the whole adventure, which inspired a degree of confidence in that quarter, in regard to the management and safety of aerial travelling, that acquired for the subject a fresh spirit of improvement.

Having thus followed out the most important experiments, and adventures made with fire balloons on the Montgolfierian principle, we will now go back a year or two to investigate the introduction and experiments of the hydrogen balloon.

The certificate presented to the Academy by the States of Vivarais, stated that the Montgolfiers' balloon was filled with a gas half as heavy as common air. Now, as it was known at that time that hydrogen gas was not more than one-eighth or one-tenth as heavy as common air, they supposed that the Montgolfiers had discovered a new kind of gas. From the large quantities of gas used in their experiments, and the very short time it took them to generate it, it was evident that it could not be hydrogen. This, together with the great difference of specific gravity of the two gases, brought them to the conclusion to make an experiment with the hydrogen.

When we consider the many and fruitless attempts that had been made by a number of ingenious men, in various parts of Europe, to contrive a machine or vessel that would be impervious to hydrogen gas, and at the same time light enough to ascend when filled with it, we can duly appreciate the result of this first experiment A subscription to defray the expenses incident to the necessary arrangements was opened by M. Faujus de Saint Fond. Persons of all classes and ranks, on being apprized of the design, eagerly sought an opportunity to put down their names. With an avidity of feeling adequate to the interest already inspired to promote the object, the money necessary to accomplish a full and complete trial was immediately subscribed. This preliminary disposition of the people, in regard to furthering an object which promised to be of vast importance to the civilized world, reflects honor on the French nation for their liberality of spirit, and desire to promote scientific objects.

Messrs. Roberts (brothers) were appointed to construct the machine, and M. Charles, Prof. of experimental philosophy, was appointed to superintend thewhole affair.

They constructed a silken bag from lutestring silk, about thirteen feet in diameter, and of a globular shape. The next step was to make this bag or balloon impervious to the gas. To effect this, it was covered with a varnish composed of gum elastic, dissolved in spirits of turpentine. The balloon had but one aperture, like the neck of a bottle, into which was fastened a stopcock, for the convenience of introducing and stopping off the gas. The whole machine, when completed, weighed twenty-five pounds.

On the 23d of August, 1783, the balloon being completed, the next to be done was to make arrangments for the inflation, and the appointment of a day on which to make the final experiment. These were matters not to be regarded slightly at that day. Members of the most celebrated institution of the age had ventured their talents and ingenuity upon the result. To generate so large a quantity of hydrogen gas at that period had many obstacles in its way. And on this account a full description of the manner in which it was conducted should be here given. The 27th of the month was the day appointed for the grand exhibition. But, in order to have ample time for alterations, and refixing any part of apparatus that might not answer the purpose, they commenced the inflation on the 23d. The balloon was suspended from a rope, which was fastened at both ends, to poles planted some distance apart for that purpose. The top of the balloon had a sort of button worked in it, to which was fastened the rope, by which it was hanging freely over the apparatus. This apparatus consisted of a series of trays, somewhat resembling a case of drawers, each drawer being lined with sheet lead, and all of them communicating to a common main pipe, from which proceeded a hose, or tube, made of the same material as that of the balloon. This hose communicated to the stop-cock of the balloon, which made the arrangement of the communication complete. The materials for generating the hydrogen gas were then placed in these cases, and the process of inflation was carried on for several hours with but very poor success. More gas was wasted than entered the balloon. After having thus labored, with little success, until two o'clock in the afternoon, they concluded to remove this apparatus and substitute another. Accordingly, they next tried a common cask, which was set up on one of its ends; in the upper end were bored two holes, one of which corresponded with the tube through which the gas was to be conducted into the balloon, the other hole was intended for the introduction of the iron filings, and the oil of vitriol. The process of inflation was next commenced with this new contrivance, which soon promised better success than the former. It will be observed that they had not, in this apparatus, the condensing tube filled with water for the gas to pass through, as we have in the present mode of inflating balloons. This rendered the inflation very dangerous to the safety of the balloon, from acid vapor that might pass into it every time the cask required replenishing with fresh materials, which it did very frequently. To obviate this difficulty in some degree, the stopcock in the neck of the balloon answered a good purpose, as, on the introduction of new materials, it could be closed to prevent the acid fumes from entering the balloon during this part of the process. Although this new arrangement answered the purpose seemingly well at first, it was discovered, after being used awhile, to present many obstacles to a successful result. After the operation had been carried on for several hours, the materials became so much heated that a great quantity of hot vapor would pass into the balloon along with the gas. To prevent the balloon from being injured by the heat, they kept a constant stream of water pumping against it. This also answered to condense the hot vapor into water. To discharge the water from it, it was frequently necessary to detach the balloon from the inflating apparatus to suffer the water to escape.

After working in this way until nine o'clock at night, they got the balloon about one-third filled; and in this state it was left until the next morning, the inflation being also discontinued during the night.

The next morning, at the break of day, the operators returned to resume their labors. On arriving at the place, they were exceedingly surprised to find the balloon completely distended, although it had been but partly filled the day before. On examining the machine, they discovered that the stopcock in the neck of the balloon had been left open, which suffered the common air to enter, and with the gas already in it, to make it completely full. This, however, did not discourage the experimenters. They immediately expelled all the air from the balloon, and commenced their operations anew, with apparently more energy and hope than the previous day. They labored assiduously until about six o'clock in the evening, when, to their great satisfactiou they saw the balloon giving evident signs of buoyancy; and at seven o'clock they found it to exert considerable effort against the rope above it, to which it had been suspended. Everything was now properly secured against all impending danger, and the operations discontinued till next day.

The following day, the 25th, they resumed their labors early in the morning. They did not on this morning, as the one previous, find anything wrong, or calculated to mar their future progress. A fresh supply of gas was introduced, and at six o'clock in the morning, the balloon was found to be capable of lifting up twenty-one pounds. The generation of gas was again discontinued, and at nine o'clock in the evening it was found to have a lifting power of eighteen pounds, having lost three pounds of levity during the day. This was attributed to the needle-holes, which were not properly filled up with varnish, and through which, it was presumed, the gas had leaked. It was again secured for the night, and the operators retired from their work.

On the following morning, being the 26th, the balloon was found to have lost a gradual proportion of gas and levity. The apparatus was again replenished with the proper materials, and a further quantity of gas was worked into the balloon. This was continued until eight o'clock in the morning, when it was again detached from the machinery. Having now a strong ascending power, it was secured by cords, by which it was suffered to rise to the height of more than a hundred feet, when it was drawn down again. This, as might naturally be supposed, brought together a great number of people. From these partial flights of letting it up, and hauling it down again, the assemblage became so great that it became necessary to secure it to its place, where it had been inflated, and a guard of soldiers placed around to prevent the crowd from pressing too closely on it, and causing it some injury. Such was their curiosity, that they had already broken through the prescribed limits, and nothing short of a strong guard was found capable of insuring its safety.

The spot where the operations had been carried on was near the Place des Victories, and the place appointed for the ascension of the balloon was the Champ de Mars. The distance between these two places is about two miles. In order to avoid, as much as possible, the difficulty of conveying the balloon from the former to the latter place, amidst so vast a concourse of people as might be anticipated would be there, it was concluded to move it next morning before daylight.

Accordingly, on the following morning, it being the 27th, at an early hour, preparations were made for its removal to the Champ de Mars. It was secured to a cart, and notwithstanding everything was in readiness to proceed before the break of day, an immense concourse of people had already assembled to escort the nocturnal traveller. Torches, flambeaux, musical instruments, guns, and everything that the lively imagination of the people could suggest, were brought into requisition, to render the procession grand and animating.

A fresh supply of gas was introduced to make up the loss which the balloon sustained during the night. It also gave the people an opportunity of seeing how the inflation was conducted. Thus the day passed on, with constantly increasing accessions to the great multitude already present. At length the discharge of artillery, at five o'clock in the afternoon, announced the signal for the experiment. The balloon was released from its moorings, and rose before the eyes of some hundred thousands of astonished spectators, amidst a copious shower of rain. Its ascent was extremely rapid, and in the short space of two minutes it attained a height of 3,123 feet. This was ascertained by observations made with instruments expressly provided for that purpose Above this elevation the balloon was lost in a dark cloud. This was signalized by another discharge of cannon. Soon after, it re-appeared for a moment, but was finally hidden behind the clouds. During the time of its visible flight, the very air was made to reverberate with shouts and demonstrations of satisfaction—a heavy shower of rain to the contrary notwithstanding. After it had remained in the atmosphere for three quarters of an hour, it descended in a field near Gonesse, a village about fifteen miles distant from the Champ de Mars. The balloon was immediately discovere and secured by some peasants, who were working in a field near its place of descent.

The manifestations of joy, and the satisfactory exclamations of the vast multitude of people that had assembled on this occasion, are most graphically described by some of the journals of that day. Although the ascent of an aerostatic machine was not of itself any longer calculated to inspire such a lively interest, this was the test of a new principle, which, if successful, was calculated to give it a new impulse, on account of its greater feasibility than the rarefied air principle.

CORRESPONDENCE.

THE PROPHETS OF GAS.

PHILADELPHIA, Sept. 10, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL.

The following bit of prophetic lore is cut from the English *Quarterly Review* of March, 1825:—"We are not advocates for visionary projects that interfere with useful establishments. *We scout the idea of a railroad as impracticable!* What can be more palpably absurd and ridiculous than the prospects held out of locomotives travelling *twice as fast* as stage coaches! We should as soon expect the people of Woolwich to suffer themselves to be fired off upon one of Congreve's ricochet rockets, as to put themselves at the mercy of such a machine, going at such a rate."

Put it in the AMERICAN GAS-LIGHT JOURNAL, and in addition, touch upon those wise heads who pronounced turnpike stock invulnerable because railroads were in the nature of things impossible. The same race, but in another generation, ridicule all gas but their own coal-gas and noddle-gas; let them alone, and let us alone, and see which will come out right. We go in for *other gas* than coal-gas.

PUMP.

THE RECONCILER METER.

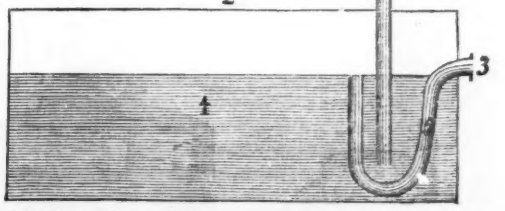
PHILADELPHIA, Sept. 10, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

In the JOURNAL of Sept. 1, 1860, page 73, is a notice of a new meter, said to be invented by G. J. Wilson, and D. H. Fox, of Reading, Pa.—for Improvements in Gas-Meters. The claims will probably appear in this issue of the JOURNAL.

The first claim appears to be for a syphon, or bent tube, being open inside the front box of meter, at the water line, and running down to the bottom of said box, or below it, (according to the amount of seal required) and then rising to just above the water line, and passing through the meter case to the outside; said tube to be used with or without a screw. This arrangement, or its equivalent, is termed the hydraulic, and has been in use in England since 1845, when it was the subject of a law suit between Smith & Botten, of London, since which it has been used in London by Smith, Botten, Edge, Shears & Sons, Meacock and Donald; also, by Laidlaw, in New York, and Hammond, in Philadelphia.

The second claim is merely lengthening the filling tube, so that it will require more pressure of gas to cause the water to overflow from the top of it; this has also been in use since 1847, when Jas. Milne & Sons, of Edinburg, used it, since which it has been used by Darracot, Boston; Laidlaw, New York; Phœnix Meter Company, Baltimore; Code, Hopper & Gratz, Philadelphia; Hammond, Philadelphia; and McDonald, of Albany. The hydraulic and high filling tube have been used in combination by Laidlaw, of New York, and Hammond, of Philadelphia. A similar arrangement is described in the London *Gas-Journal*, of Feb. 1st, 1859, page 59, being an invention of Thomas Scholefield, of Paris, gas-meter manufacturer. Patent, No. 1,248, dated June 3, 1858. The following is a rough sketch, of Mr. Scholefield's meter:



1. Filling Tube; 2. Front box of meter; 3. Water-line; 4. Water; 5. A bent pipe, to regulate the level of the water inthe trough.

OBJECTIONS TO THE USE OF THE SYPHON:

First. It is possible, by the pressure of gas, to blow out the water it contains, if so, a serious leak of gas is the result. 2d. A consumer may blow out all the water, and make an attachment, and consume as much unmeasured gas as he requires. This has been found the case where it has been used. The shape of either tube may be varied considerably, and still the object effected be the same.

ENGINEER.

PATENTS.

Inventors are informed that Patents are procured at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, through F. C. TREADWELL, Jr., Esq., an experienced Patent Agent and Expert.

UNITED STATES.

23,653.—Wm. Blake, of Boston, Mass., for an Improvement in Cleansing Galvanized Iron Pipes :

I claim my new process, substantially as specified, for effecting the removal of the surplus zinc from a galvanized or zinc-coated screw, the essential element of such process being the heating of the tube, or rod, and the putting it in revolution by means substantially as described, against a brush, or equivalent, for producing friction.

29,677.—James Dakin, of Cleveland, Ohio, for an Improved Mode of Elevating and Delivering Water from Wells ;

I claim the inclined board, K, performing the several functions described, in combination with the spouts, A' and E', bucket, E, valve, M, rod, I, rope, S, and counter-balance weight, F—the whole being constructed, arranged and operated in the manner and for the purpose set forth.

29,723.—Wm. Shearer, of Atlanta, Geo,, for an Improvement in Pumps :

I claim, first, The combination of the screw pisten rod, H, openings, O, with journal, J, and nut plates, b b, substantially as set forth.

Second, I claim the combination of the screw piston rod, H, with its piston heads, i i, packings, j j, and plates, k k ll, with chambers, B B', and water passages, d e, arranged to operate in relation to each other, as and for the purposes set forth.

29,729.—J. H. Tatum, of New York City, for an Improvement in Candle-wicks :

I claim the plaited wick for candles, composed of five strands, so arranged that the strands on either side of the wick run from both edges toward the center in an upward direction, or from the center toward both edges in an upward direction, as described.

[The structure of this wick is explained by the claim. The object of the invention is to obtain the necessary degree of capilliary, and at the same time to make the wick stand up stiff enough and make it stand out of the flame in order to be consumed.]

29,731.—T. S. Truss, of Darlington, England, for an Improvement in the construction and Joining of Pipes :

I claim the making of an expansive or contractile joint by which pipes (for the transmission of gas, water, steam or other fluid) are to be secured together by means of a compressing or nut-coupling strap, in two or more parts, with packing material upon, between or around the ends of the pipes embraced by the strap.

I also claim as my invention the making of the junctures of couping straps with recesses and corresponding projections or loose blocks.

I also claim as my invention the making of pipes with flanges at or adjoining their ends, to be used with or operated upon by a compressing or nut-coupling strap, with packing materials upon, between or around the same and embraced by the strap. I wish it, however, to be distinctly understood that I do not claim pipes with flanges at their ends, secured together by bolts, pins, or colters passing through the same.

29,740.—G. J. Wilson and D. H. Fox, of Reading, Pa., for an Improvement in Gas-Meters :

We claim, first, The application of tube, V, of any convenient length, size, shape or form, and located at any convenient place in or on the meter, with one end open inside of the meter at or about the working water-level of a wet gas meter, with the other or outer end opened or closed by a screw or otherwise, at or about the water level of the water.

Second, The application and combination with tube, V, and the other general arrangement of a wet gas meter, of a filling tube, W, of any convenient size, shape or form, with the lower end passing high enough to overcome the pressure of gas in the meter to prevent an overflow of water, and an open filling tube, also, to admit of water being filled into the meter, without turning off the gas.

29,742,—Charles Worden, of Ypsilanti, Mich., for an Improved Apparatus for Regulating the Flow of Water from Cisterns :

I claim the combination of the float, piston and box, with partitions, B and W, having openings, J G F, and pipes, A and K ; the whole constructed, arranged, and operated in the manner and for the purpose set forth.

29,743 —John Bird, of Birmingham, Pa., assignor to Bakewell, Pears & Co., of Pittsburgh, Pa., for an Improved fastening for Metallic Covers to Glass Vessels :

I claim attaching the metallic hinged cover to lager bier glasses and other vessels made of glass or earthenware, by means of a lug or lugs pressed on the rim of a vessel, having a suitable cavity in it, if there be one lug only, or between them if there be two lugs, in combination with a hinged cover having a tenon or pin to fit into said cavity attached to the lower hinge piece ; the whole being arranged and constructed and attached substantially as described.

27,744.—H. A. Chapin, of Springfield, Mass., assignor to Wm. L. Schoener & Co., of New York City, for an Improvement in Stop-cocks :

I claim, in combination with the valve, B, and its seat and opening in the shell, C, the valve, G, and its seat and opening, F, in the shell, A ; the several parts being arranged to operate as set forth and described.

29,745.—Henry Demmick (assignor to himself and P. H. Jackson), of New York City, for an improvement in Flasks, for Casting Iron Columns :

I claim the flask for casting columns, composed of two cheek pieces, b b, hinged on to the knowl, a, and provided with the sand cleats, g', as and for the purposes specified.

I also claim the movable metallic sand flanges, h h, formed with dove tailed bases, entering between the ribs cast on the inside faces of the cheeks, b b, so as to be removable at pleasure, as set forth.

I claim the divided cheek pieces, b b, and clamps, f f, fitted in the manner specified, so that the flask can be enlarged by separating said cheek pieces and introducing a bar between said parts, as specified.

29,810.—H. G. Nelson, of Lockport, N. Y., for an Improvement in Water Wheels :

I claim the arrangement of the gates, I I, shafts, H H, and sectors, J J, with the shaft, D, vent, C, and case, A : all as shown and described for the purpose set forth.

[This invention consists in a novel and improved manner of constructing the wheel, whereby a very cheap, simple, and durable wheel, with oblique or tangential buckets is obtained. The invention also consists in an improved gate, arranged and applied to the scroll so as to regulate the discharge of the water therefrom, and its consequent action on the wheel.

29,831.—T. B. Smith, of Marietta, Ohio, for an Improvement in Lamps :

I claim, first, the peculiarly constructed burner described, consisting of the wick tube, T, and cup, C, constructed and united in the manner set forth.

Second, The shade, S, formed and operating as described.

29,838.—J. T. Williams, of York Borough, Pa., for an Improvement in Lamps :

I claim the employment, in combination with a lamp that is supplied from an elevated reservoir of a transparent section, F, when said section is arranged between the lamp and the oil supply on a line horizontal to the proper oil level of the lamp, so as to facilitate the replenishing of the lamp without extinguishing the flame and without overflow, all as shown and described.

29,843.—Joseph Hardey (assignor to O. Chamberlain and W. H. Babcock), of Moline, Ill., for an Improvement in Plows :

I claim the arrangement of the axle, B, plow, G, beam H, guide bar, I, rack, J, sector, K, standard, M, caster wheel, F, arbor, E, and frame, A, all as shown and described, for the purpose se forth.

[This invention relates to that class of plows which are connected to a mounted frame containing a driver's seat, and are generally known as sulky or carriage plows. The invention has for its object the ready and facile adjustment of the plow, and also of the wheels, whereby the device may be adapted to its work so as to plow or form a furrow of greater or less depth as occasion may require, and also adapted so as to be readily drawn from place to place.]

RE-ISSUE.

Charles Wilhelm and Anna C. Wilhelm, of Philadelphia Pa,, for an Improvement in Lamp Shades, Patented May 3, 1859, re-issue dated August 14, 1860 :

We claim, first, The combination of the metallic shade, A A' A'', with the paper pictures, C' D' E', between sheets of mica, as described.

Second, We also claim the combination of the metallic frame, A A' A'', and the pictures, C' D' E', upon paper or any other suitable substance, substantially as described.

Third, We also claim the combination of the metallic frame, A A' A'', and the pictures, C' D' E', upon paper or other suitable substance, and the mica lining ; the whole being arranged substantially as set forth.

JOHN J. GRIFFIN & CO.,

No. 7 BEEKMAN Street, and 76 West 37th Street,

NEW YORK CITY,

MANUFACTURERS OF WET AND DRY GAS-METERS,

Station-Meters, Proving-Machines, Show-Meters, Test-Meters, Pressure Indicators, &c.

All of our Work is Guaranteed to be of the First Quality, as well as the material, and for this we can refer to numerous Gas-Light Companies.

CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT-ST., PHILADELPHIA.

MANUFACTURERS OF

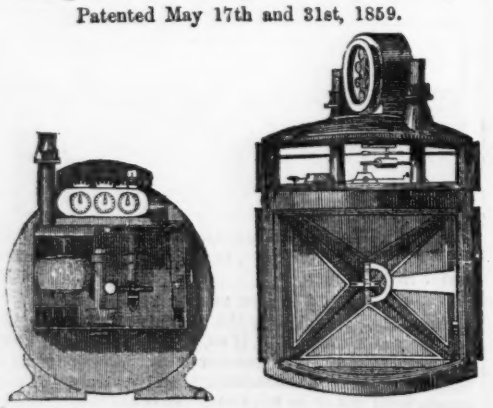
Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimenta Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *Guarantee Entire Satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction ; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.

HARRIS & BROTHER'S

Improved Dry Gas-Meter,

Patented May 17th and 31st, 1859.



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Coal-Scoops

AND

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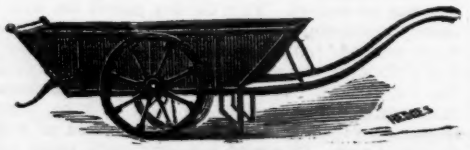

FOR GAS-WORKS.

FURMAN-St., Near Fulton Ferry, Brooklyn, N. Y. Samples are on Exhibition at the Rooms of THE AMERICAN GAS-LIGHT JOURNAL.

WILLIAM ROY,

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NEW YORK, IMPORTER OF THE CELEBRATED PERCETON FIRE-CLAY RETORTS the quality of which is superior to any other clay yet discovered. Analysis under :

Silica	62.5	Magnesia	0.3
Alumina	35.0	Prox. of Manganese	0.2
Prox. of Iron	0.9	Phos. of Iron	0.5
Lime	0.6		

VITRIFIED FIRE-CLAY PIPES, from 2-inch to 36-inch, diameter, in lengths of two or three feet ; are indestructible, and not affected by gases or acids.

Thomas Edington & Son's PATENT CAST-IRON PIPES are cast vertically to any weight required. They can also be coated with Dr Smith's Solution, which prevents corrosion ; adapted for gas and water. Made in lengths of nine and twelve feet, or turned and bored joints.

WROUGHT IRON TUBES and all materials for gas and water works, Fire-Bricks, Fire-Clay, Water Hydrants, Scotch and English Canne Coal, &c. Kennedy's Water Meters for measuring the flow of water—indispensable to all water companies.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweights in such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal where the Holder is on the Telescopic plan. Holders that work out of level, are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holder in good working order; moreover, with this attachment, deep tanks are not necessary.

BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts, is alone sufficient to recommend its general adoption. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 221. Address

P. T. BURTIS,
Engineer Gas-Works, Chicago, Ill.

C. R. WOODWORTH, Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET.
New York City.

BUTLER'S PATENT PORTABLE Gas-Works are designed for Dwellings, Churches, Factories and Country Villages, as well as for large consumers in cities. They make gas from CRUDE ROSIN, and are WARRANTED to make as rich an article, at less than ONE-HALF the cost of that made by the old method in Portable Gas-Works, and at one-third the average price of Coal-Gas as sold in cities. Great savings in expense of light GUARANTEED to large consumers.

Works of all sizes furnished to suit applicants. Mains, Service and Distributing Pipes put in. Also, a large assortment of Gas-Chandeliers, and other fixtures, always on hand, at the lowest prices.

The MANSION HOUSE, BROOKLYN, with 250 burners in constant use, make their own gas with my apparatus, with results as stated above. This, (with a small one at my store,) can be seen in operation by application at my office, where descriptive pamphlets, with the names of numbers who are using them, will be furnished.

JOHN BUTLER,
Nos. 112 Fulton & 15 Henry-st., Brooklyn, N.Y

FOR LIGHTING R. R. CARS, and Steamboats with Gas.—The whole process of filling the holders of a train requires but three minutes. Where the cars can stand on the track for thirty minutes, the gas is passed ,directly from the pump through the pipes and into the holders, thus doing away with the reservoir entirely; this may be done at either end of the road. This apparatus has been used on the New Jersey railroad nearly two years and for more than a year on the Camden and Amboy R. R., and the Philadelphia and Reading R. R. The Camden and Amboy R. R. Co. have the apparatus on all their cars, and on two of their Ferry Boats. The uniform flow of gas is secured by a Patent Regulator. This apparatus is also adapted to Steamboats making trips of not over three or four days in length, and to the head-lights of Locomotives.

It can be seen in operation at the Rooms of the AMERICAN GAS-LIGHT JOURNAL. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245.

Apply to the
NEW YORK CAR & STEAMBOAT GAS CO.,
No. 117 Fulton street, N. Y.

GAS FOR THE COUNTRY.—C. WOOSTER, Manufacturer of Improved Portable Gas-Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories, Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.

This Machine has been in successful operation for years, in many of the best residences and factories in the country, and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one half the price usually charged for that gas.

Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.

For further particulars, and descriptive pamphlet containing references to numerous parties now using the apparatus, address

C WOOSTER,
No. 256 Canal-st., near Broadway, N. Y.

For Engravings, see AMERICAN GAS-LIGHT JOURNAL, for June, 1860, page 245.

☞ Responsible Agents wanted, with whom liberal arrangements will be made.

APPLETON'S IMPROVED GAS-Works, for Factories, Hotels, Dwellings, and Towns. The most simple and economical works in use, furnishing a superior light to coal gas at a cost of one half a cent per burner per hour. It does not injure trees, or plate, and is not affected by cold. For Circular and Terms apply to

APPLETON & GRAHAM,
56 Washington street, Boston.

For Engravings, see AMERICAN GAS-LIGHT JOURNAL for April, page 213.

ROSIN GAS-WORKS, for Factories, Hotels, and Public Buildings. These works may be seen in operation at the Berkshire Woolen Mills, Great Barrington, Mass.; Manchester Mills, Manchester, Conn.; A. A. Van Alen & Co's. Factories, Stvesant Falls, N.Y., and many other places

JAMES O. MORSE & CO.,
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JOHN COX & CO., No. 696 Broadway, cor. of Fourth street, New York. Importers of French and English Gas-Fixtures of every description, Paris Clocks, Real Bronzes, &c. Manufacturers of Silver Ware.

MARSH'S PATENT ROSIN or Sun-Light Gas-Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-Houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.,
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H. R. WORTHINGTON'S Patent Water-Meter.—This Meter combines accuracy, simplicity, and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities with its low cost, have caused its extensive adoption by corporations and individuals in many of our largest cities. Particular information can begiven at the office of the undersigned, where a Meter can be seen in operation.

For sale, at greatly reduced prices, WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. Also, a new and highly successful PUMP, driven by water-pressure, requiring no attention or repairs, and the most economical water-motor yet constructed.

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One of these Water-Meters can be seen in operation at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

PHILADELPHIA GAS FIXTURE Works.—Warner, Miskey & Merrill, Manufacturers, Store, No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, New York, would respectfully inform the public that they continue to Manufacture all kinds of Gas Fixtures, Lamps, Girandoles, Bronzes, &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, 376 Broadway, a large and full assortment of all their manufactured Goods. Dealers and others are invited to call and examine.

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Painting, Paneling, Cabinet Work, Looking-Glass Plates, Mirror Frames, Silk, Worsted and Woolen Materials, Aubusson and Moquette Carpets, Gas Fixtures, Bronzes &c.

GAS FIXTURES TO BE SOLD at Wholesale Prices.—In consequence of alterations in his store, the Subscriber is obliged to dispose of his enire stock of Gas Fixtures. Those wishing to purchase at very low prices will do well to call. Gas Fixtures removed. Gas fitting executed in all its branches.

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Manufacturers of the best quality of all the varieties of Connections for Iron Pipes; both Malleable, Wrought and Cast Iron. Also Meter Cocks, Lamp Cocks, &c.

Also, sole manufacturers of a New Meter Cock, which connects with Lead Pipe, forming a perfect joint without solder. Also, a connection for Lead pipe, without the use of solder.

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Wrought Iron Pipe of best quality, for sale. Orders solicited.

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The subscriber continues to manufacture Superior Cast-Iron Gas and Water Pipes, Branches, Bends, Angles, Bevel Hubs, Reduces, Sleeves, Drip Syphons, Plugs, Caps, Retorts, Bench Castings, and Castings in general, Particular attention paid to all Castings connected with Gas Works. E. B. EARL.

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According to Professor Faraday, the watery vapor contained in illuminating gas amounts to 0·0093 parts where the gas is at a temperature of 40°, or in other words, that there are 1, 7-10 *gills water in every* 1,000 *cubic feet of gas* at that temperature. It is the deposit of this water in the form of frost that closes the exposed pipes.

Walton's plan is, in a few words, to supply this water with a sufficient quantity of alcohol (98–100ths), the vapor of which will enable it to pass through the most exposed pipes, unaffected by frost. Experiments of three years prove that one gill of such alcohol will protect 1,000 feet of gas at any temperature. Private houses, Hotels and Gas-works, can be thus guarantied from frost by the use of Walton's Anti-Freezer, which consists of but two or three small castings, at the most trifling cost. It can be applied at Gas-works without altering any of the pipes; and the expense of labor and the alcohol will not exceed two cents per 1,000 feet of gas.

It can be seen in operation at the rooms of the AMERICAN GAS-LIGHT JOURNAL, where orders will be executed at once.

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DEAR SIR,—At an earlier date, I intended to have written you the result of my experience during last winter, in regard to your patented apparatus to prevent the freezing of gas in pipes. I am quite convinced that both in theory and practice your apparatus is correct, and in no case will it fail to prevent the freezing in pipes of our illuminating carburretted hydrogen gas, provided attention is paid to renew the alcohol often enough in proportion to the amount of gas passing through the anti-freezing apparatus.

Yours truly, JOHN JEFFREY.

OFFICE LOUISVILLE, KY., GAS CO., March 30th, 1860.

In the winter of 1856, this Gas Company first applied John Walton's patent method for the prevention of Frost in Service Pipes,—to this date we have used it with perfect success. *This Company have Purchased the Right to this Patent for Louisville, Kentucky.*

The application of a vessel, containing a small quantity of alcohol, placed between the gas main and an open area connected with a building, through which the service pipe was laid, has always prevented the freezing or stoppage of the service pipe, although the temperature may have ranged from the freeezing point to several degrees below zero.

As the alcohol absorbs from the gas any vapor of the water that may be passing off with it, after passing the vessel containing alcohol, there remains in the gas nothing that can freeze or close the pipe. *This simple application, we have proved to be an effectual safeguard against the closing of gas pipes with frost.*

ROBERT G. COURTENAY, President.

ANALYTICAL & Manufacturing Chemistry.—Gesner's Chemical and Engineering Rooms, 24 William-street, New York Rooms No. 28 and 29. Analysis made of all mineral and commercial articles Coal oils tested, coal oil works erected, and contracts made. The best processes for purifying and deodorizing; coal and petroleum oils furnished, with skilful workmen and superintendents. Mines surveyed and coal tested.

The Kerosene patents, from which the coal oil business in the United States originated, were granted to Dr. Gesner, Chemist and Geologist.

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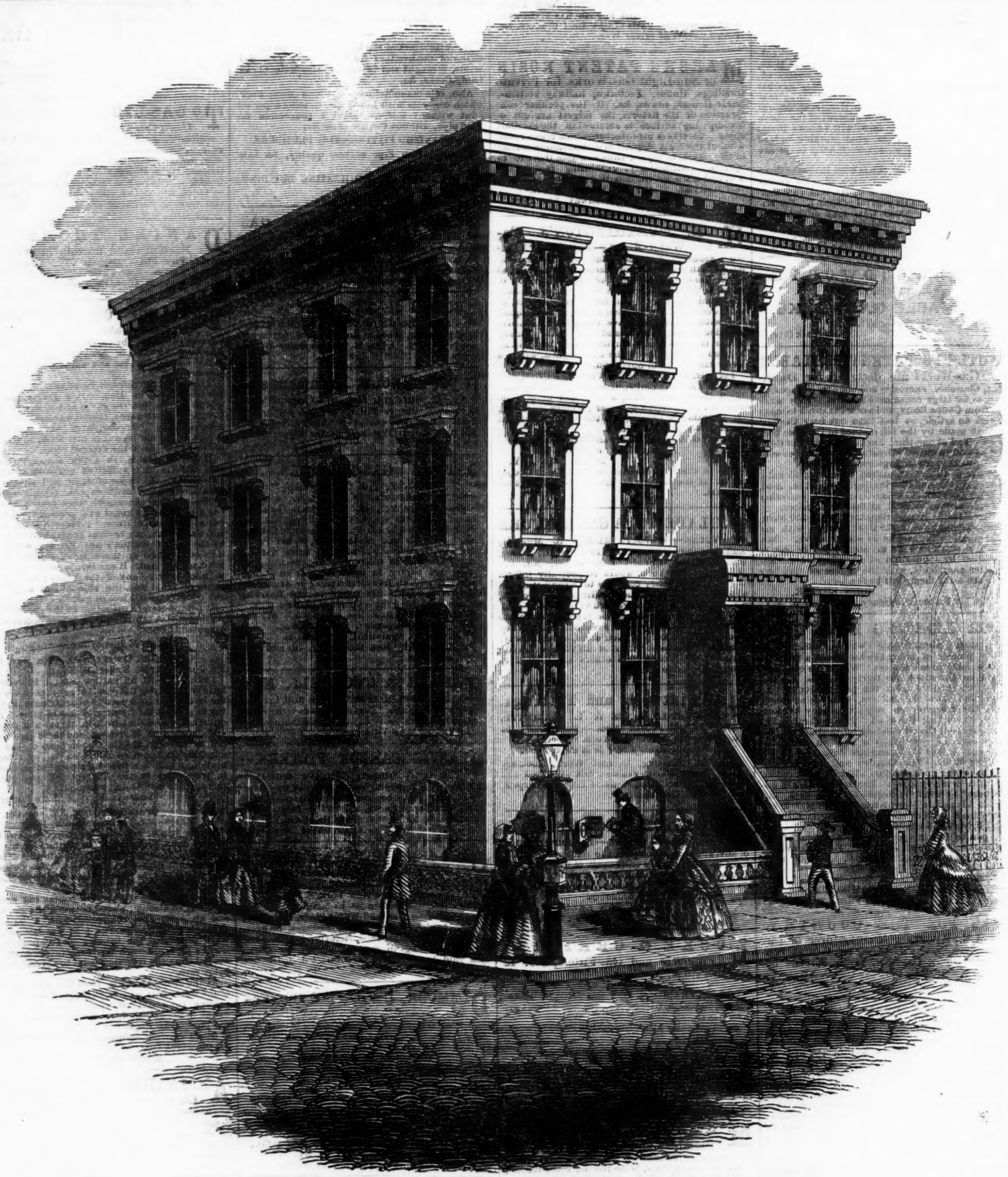
S. S. ASHCRAFT, Cincinnati, O., Manufacturer of Gas and Water-Pipes, with Branches of every description; Retorts for Gas and Oil Works; Gasholder Stands, Columns, &c., Gas Purifiers, Condensers, and Gas Apparatus of all kinds; Foundry Work in general.

N. B.—A complete selection of Patterns on hand. Refer to any of the Gas Works in the Western and Southwestern States.

THEODORE SCOWDEN, Engineer, Louisville.
JOHN JEFFREY, Civil Engineer, Cincinnati.
JACOB HOUGHTON, Engineer, Detroit.



THE TWO GREAT PATENTS OF THE DAY.

1.—Improved Mode of Setting Gas-Meters in the Walls of Buildings.

2.—Cast-Iron Mail-Stations for Public Lamp-Posts.

Adopted by the UNITED STATES GOVERNMENT for the Principal Cities.

ALBERT POTTS, Philadelphia, Patentee.

By the FIRST IMPROVEMENT the Meters may be inspected at any time from without, by the agents of the Gas-Company having keys for that purpose. Thus burglars need no longer gain admittance to dwellings under pretense of examining the meters, while they, in fact, examine the fastenings. The meter-box, being neatly and securely imbedded in the front wall, the meter is protected against frost by means of a thick pad on the back of the door. It has been satisfactorily tested in long continued severe weather and found to be eminently successful.

The SECOND IMPROVEMENT speaks for itself. The cities of New York and Philadelphia are already supplied with these boxes, and the convenience to the citizens and increase of revenue to the Post-Office Department are most marked. Always in sight, securely fastened to the most public objects, protected by light, day and night, they have become the most popular of all modern improvements and will be immediately adopted throughout the country.

Both of these improvements are to be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, New-York City. For further information address the Proprietor of this JOURNAL, who is authorised to contract for the use of both Improvements, or

ALBERT POTTS, Philadelphia.

JOHN RUSSELL & CO.,

PATENT TUBE MAKERS,

THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE

69 UPPER THAMES-ST., & 5 CHARLES-ST., SOHO, LONDON;

AND 35 GRANBY-ROW, MANCHESTER, ENGLAND.

The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lapwelded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass-work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST IRON PIPE AND GAS-METERS.

ALL GOODS WARRANTED.

GENGEMBRE'S PATENT NON-FREEZING AND NON-EVAPORATING GAS-METER FLUID.

By the use of this Fluid, the WET GAS-METER of ordinary construction is rendered the most perfect and most reliable Gas Measuring Instrument ever offered to Gas Companies. In winter the Meter will continue to work equally well, *however exposed it may be*, and in summer the level of the Fluid remaining constant, without refilling the measurement of the Gas, will be both uniform and constant.

The use of this Fluid is both easy and economical, and Gas Companies desirous of using it, will be licensed on liberal terms. For further particulars, and certificates of parties having used the same for over three years, and for city rights, apply to

A. DOISY, Box 1180,
General Agent and Attorney for GENGEMBRE'S PATENT.

N. B.—No Sales of Territorial right, or Licenses for using my Patent will be valid, without being ratified by my Signature, as I have no Agent authorized to execute the same.

H. B. GENGEMBRE, PATENTEE,
Box 48, Alleghany City, Penn.

PHILLIPS & ALLEN,

Pensylvania av., above 22d st., Philadelphia.

GASOMETER RIVETS.

Every kind of Rivets used in Gasometers.

CANDLES FROM COAL.—A New Invention, Manufactured by the

NEW YORK PARAFFINE CANDLE COMPANY,

UNDER

MEUCCI'S PATENT.

These Candles being made from one of the products of the distillation of Coal, and having the same chemical constituents as gas, being, in fact,

GAS SOLIDIFIED,

are eminently adapted for giving light. They took the highest premium at the late Fair of the American Institute, held October, 1859, as may be seen from the following extract from the report of the Committee:—

"Our tests with the Photometer showed that the Paraffine Candles above referred to, as compared with the best Sperm, had greater illuminating power, gave a softer and pleasanter light to read by, and burned full ten per cent. longer than the standard Sperm Candle, and we recommend it as deserving the highest premium of the Institute.

"ISAIAH DECK, M. D.,
"Analytical and Consulting Chemist.
"JOSEPH YATES,
"Civil Engineer."

The Candles manufactured by this Company are warranted to stand all climates, will not run or gutter, and require no snuffing, and, unlike some other so-called Paraffine Candles,

DO NOT SMOKE IN BURNING OR BECOME YELLOW WITH AGE, AND ARE WITHOUT ODOR.

CAUTION.—As an Imitation Candle is already offored in the market, purchasers should bear in mind that every box of Candles sold by this Company is stamped with its adopted trade mark, which is a circle, enclosing the words, "NEW YORK PARAFFINE CANDLE CO., MEUCCI'S PATENT, 1859," with our trade mark as above, to imitate which is felony by law.

WM. E. RIDER, 16 Beekman-st., N. Y.,
Agent for the Company.

STANDARD Photometric Candles.—Owing to a number of Applications made to me for information concerning the supply of the "Standard Sperm Candles," used in Photometrics, I have obtained a supply, from which I can furnish those who require them with full directions for use. T. W. PARMELE,
No. 4 Irving Place, New York.

D. C. GREEN'S PARAFFINE 42½ Gall. Lubricating Oil.—228 Pearl street, New York. Benzole, Crude Coal Oils, Naptha, Burning Coal Oils, Paraffine, Paraffine Candles.

DEPOT AND WAREROOM of the New-York Columbian Oil Company, 58 Courtland street, New York.
G. M. WHEATON, Agent.

COPE'S PATENTED COAL OIL Pump.—Reliable and effective. Manufactured by S. CUMMINGS & SON,
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DANIEL WADSWORTH & CO., Coal Oil Manufacturers, Wholesale Dealers in Oils and Naval Stores, and Commission Merchants,
DANIEL WADSWORTH,
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ORION COAL OIL WORKS—Office, 116 Maiden Lane, New York.—Illuminating, Crude and Lubricating Oils, Paraffine, Naptha and Paraffine Candles; constantly on hand an assortment of Coal Oil Lamps.

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ROBERT A. CHEESEBROUGH,
Depot 204 Pearl st., cor. Maiden Lane, N. Y.
Works on Red Hook, Brooklyn, manufacturer of Illuminating, Lubricating, Binnacle and Head Light Coal Oils. Also, Agent for the Aladdin Coal Oil Works, Pittsburg.

CARBON OIL CO.—191 Pearl St., near Maiden Lane, N. Y.—Carbon Oil is the product of pure Petroleum, (from the Oil Wells of Pennsylvania,) which makes an illuminating Oil of greater purity than any other Mineral Substance known. Is not explosive, and is for sale, with a general assortment of Lamps, Burners, Chimneys, &c.

DIRECTIONS.—Trim the wick even with the tube, (clipping off the corners slightly). After lighting and putting on the chimney, allow the flame to burn low for a minute, to prevent breaking the chimney. While burning, the wick must always be kept below the top of the cone.

TO COAL OIL REFINERS.—Having made arrangements with the Proprietor of the principal wells yielding Petroleum, or Seneca Oil, in the State of Pennsylvania, we are constantly receiving supplies, and are prepared to offer this article on the most favorable terms, and in quantities to suit purchasers. SCHIEFFELIN BROTHERS & CO.,
170 William street.

STREET GAS-LANTERNS.

Cities and Gas Companies furnished at reasonable rates with Lanterns, Iron Frames, Grazed Complete or Separate. Also, Fancy Lanterns, for Hotels, Restaurants, Theatres, Telegraph Offices, Churches, and other Public Buildings. Having been in the business for many years I fully understand the manufacture of Gas Lanterns, and with the aid of machinery can make the parts cheaper than any other manufacturer. Orders from a distance solicited, and executed promply.

A. C. PARRY,
31 Race Street, Cincinnati, Ohio.

ENAMEL DIALS FOR GAS AND WATER METERS,
BOTTOMLEY & HINES, MANUFACTURERS, West Philadelphia, Pa.

The best, therefore the cheapest for Gas and Water Meters and Engineers' Indicators.

These Dials are particularly adapted to all purposes where gas, gas-vapors, or acids, are present. Also, Watch and Clock Dials of every description, from any size up to 14 inches diameter.

The undersigned embrace this opportunity of returning their thanks to the gas-meter manufacturers throughout the United States, for the very liberal patronage they have received for the past ten years, during which they have been established in Philadelphia, which has placed us ahead of all competition. Our sales for the past year have been far greater than we could have anticipated, with the prospects of a steady increase. Our constant aim has been, and will be, to adopt all improved processes of manufacture, combining improvement in quality with reduction in price. All Dials made by us are warranted to be as represented, and of the best materials and workmanship, which will recommend them to all parties wishing the very best. Circulars sent free by mail, or on application.

We are the appointed agents for HUNTER, SHEARMAN & CO.'S make of BRASS PINION-WIRE for Gas-meters, which we believe is equal to the best.

EMPIRE STATE COAL OIL CO.— Manufacturers of Refined, Bleached, and Deodorized Coal Oil, Factory on Smith street, Brooklyn, L. I.; Store, 240 Pearl street, corner Burling Slip, New York.

COAL OIL.—10,000 Gallons Celebrated Kerosene Coal Oil, 5,000 Gallons Boston Coal Oil, and other brands, at $1.25 per gallon. STANFORD BROTHERS,
Pacific Oil and Camphene Works, cor. of Front and California streets, San Francisco, Cal.

HENDRICKSON & SHATTUCK, Manufacturers of the Excelsior Lubricating Oil, Philogene and Paraffine Oils; also, Dealers in Sperm, Lard, Whale, Elephant, Tanners', Tallow, Coal, Neatsfoots, Paint and other Oils, Office, No. 22 Cedar street, between William and Pearl streets. D. W. HENDRICKSON,
ALBERT G. SHATTUCK, New York.

Rosin Oil and Rosin.—For sale of our own manufacture a superior article of ROSIN OIL, for Gas purposes. Also Refined Oil. For shipment in secure iron-bound barrels, or by any single barrel.

Address MARYLAND GAS COMPANY, No. 6 Bank of Baltimore Building, Baltimore, Md.

P. S. This Company is also prepared to construct their superior Patented GAS WORKS of any capacity, from that required for a private dwelling, hotel, church, college or factory, to such as will supply cities and towns, complete in all their parts for the manufacture of GAS, from either Rosin Oil, Coal, or Rosin.

WHEELER & HOYT.—Distillers of Camphene Alcohol, and Manufacturers of the best quality of burning Fluid; also, Dealers in Oils and Naval Stores of every description. Office, 206 Pearl street, near Maiden Lane, New York. F. A. WHEELER,
H. S. HOYT.

JAMES A. WEBB, Manufacturer of Alcohol, Camphene, and Burning Fluid, No. 165 Pearl street, New York.

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P. CONWAY, Manufacturer of Oil Cans, square and round, of every size, Druggists' and Shipping Cans made tight, and delivered to any part of the city, by sending to No. 138 MAIDEN LANE, N. Y.

TO CANDLE AND SOAP Makers.—Processes with drawings to manufacture every kind of candles and soaps by different processes: Candles by distillation, saponification, French candles, common candles, hard and soft soaps, palm soaps; processes to bleach palm oil and make candles out of it; purification of tallow; essays on greases and soaps. Address, Professor H. DUSSAUCE, Chemist, New Lebanon, N. Y.

SCHWARZ'S PATENT STEAtite, or Lava Gas-Burner Tips.—These obtained a Gold Prize Medal in Europe, where they are now extensively used in place of metal tips. In Prof. Liebig's and other Chemists' works, these burners are recommended as *indestructible by acids or alkalies, unchangeable by heat or cold, not liable to rust or corrosion*, and superior in economy to the metal tips. Boston and other cities have adopted them for street lights after a satisfactory trial. They are imported from Germany by the undersigned, sole Agent for America, who can now supply the trade or cities at reduced prices, with any pattern of tips to fit the double cylinder or other kind of burners. For sale also, Large Gas Heating Burners, of same material, for Chemists, &c. W. W. WARREN,
25 Kilby-st., Boston

COAL-OIL LAMP,

WITHOUT A CHIMNEY.

PATENT RIGHTS FOR SALE.

The attention of Lamp Manufacturers, Coal-Oil and Petroleum Refiners, and the public generally, is called to the

ACAMINE LAMP,

now on exhibition at the office of the undersigned.

The Acamine Lamp burns Kerosene, Coal, Carbon, and the Hydro-Carbon Oils, &c.,

Without Chimney, Smoke, Smell,

or any of the objections hitherto supposed insurmountable.

It gives a brilliant light, nearly resembling gas, and a very persistent flame; is portable, easily managed, (has no machinery,) entirely safe, and can be manufactured of any required size. The advantage of such a Lamp will be self evident to every consumer of Coal-Oil.

This Lamp is the invention of W. H. Racey, Esq., of East Florida, and the security to the same being guaranteed to him as the Patentee and owner of several patents, and many hundred registrations in Europe and America completely covering the invention, the

PATENT RIGHTS

for the latter are now offered for sale.

To parties desirous of securing the control of this invention for the *whole* United States, the expediency is suggested of a prompt, a limited, liberal and direct application, as its exhibition will only take place (as thus far determined) in the City of New York, and that for only period, the patentee, in the event of a speedy and satisfactory negotiation not taking place, having made arrangements for its disposal in another form. Parties wishing to negotiate for the same will please apply to HORATIO EAGLE,
No. 254 Canal st., near Broadway, N. Y.

A. & G. BRANDON, Manufacturers of Street and Fancy

LAMPS,

of every pattern, for Hotels, Saloons and Public Buildings, on hand and made order.

Cities, Villages, and Gas Companies supplied with Street Lamps, on favorable terms. Office, No. 4 TYRON ROW, City Hall Square, and Manufactory, No. 102 Mulberry street, one door from Canal street, New-York.

PARAGON SELF-GENERATING

GAS-LIGHT BURNER.

Complete in itself, without other machinery. Applied with founts to gas-fixtures in every variety; also, to hand-lamps such as use oil, burning fluid, coal oils, &c., making its own gas in the burner, *with entire safety from burning fluid.* Devoid of smell, smoke, or flicker; combining simplicity, economy and brilliancy of light in any temperature; adapted to and used by churches, factories, dwellings, hotels, steamers, railroad cars, omnibuses, private carriages, street lamps, &c., &c.—all at an expense of less than one cent per hour each burner. Call and see this light for the million, or send for circular,

BUTLER, HOSFORD & CO.,
30 Broadway, N. Y.

State and county rights for sale. Parties wanting gas in large or small quantities, should apply as above before making other engagements.

POTTS' REVOLVING SIGNAL LIGHTS,

PATENTED SEPTEMBER 8, 1857.

MR. ALBERT POTTS, the well known Inventor of the LAMP-POST LETTER-BOXES, which have been adopted by the Post-Office Department for the large cities of the United States—and also of the GAS-METER BOX, to be set in the front walls of houses, thus doing away with visits from Gas Inspectors, or burglars in gas-clothing, has lately brought forward a third Invention, which in point of importance and world-wide usefulness, surpasses the others entirely.

These SIGNAL LIGHTS are intended for use on Vessels propelled by Steam, and those exclusively. They specially indicate the presence of a Steamer, and by their use, there will be less likelihood of mistakes, and consequent collision than at present. They are also intended for SIGNALLING AT NIGHT, and can be used for that purpose UNDER ANY CODE of SIGNALS NOW ARRANGED FOR FLAGS.

This Improvement in Lights for Steam Vessels, consists in having the Lanterns containing the colored lights, connected by means of a series of cogged gearing with some convenient part of the Engine or Machinery, so as to cause them to have a revolving motion around their axis. On side wheel steamers, the Lanterns should be placed directly over the wheel-houses, and the power, or motion to turn them, may then be very conveniently obtained from the paddle-wheel shaft. On Propellers, the Lanterns should be placed on each side of the Pilot House, or hurricane deck, and the rotary motion derived from any convenient or suitable part of the Engine or Propeller Shaft. Each Lantern is supported on the end of movable cranes, so that their relative positions may be changed and properly adjusted to suit the view of observers on either side of the vessel at the time of signalling.

The Lanterns to be used in this improvement, may be constructed for Burning Oils, Fluids, Gas, or any of the known modes of illumination, and should be furnished with one or more lenses and reflectors, so as to concentrate the rays of light, and project them over the horizon with the greatest intensity. The lenses for this purpose should be made with colored glass, viz., Red and Green, and the position of the respective Lanterns, according to the color of the lenses therein, must be placed on the sides of the vessel so as to answer to the requirements of Rules and Regulations made and published by the Supervising Inspectors of Steamboats, agreeably to the Act of Congress of the United States in such cases made and provided. That is to say—by said Regulation—the Lantern having the green lenses for producing the Green Colored Light, must be placed on the starboard side of the vessel, and the other Lantern producing the Red Light, to be placed on the port side thereof. In pursuance, also, of the aforesaid Rules and Regulations, there is to be found in board and behind each Lantern, a screen to answer the purposes therein mentioned.

The cogged gearing, by which the Lanterns are connected with the Engine or paddle wheel shaft, and thereby caused to revolve when the Engine is in motion, is so arranged that the connection may be readily shipped or unshipped, and the lanterns made stationary or otherwise, at the pleasure of the Pilot, or those whose duty it may be to operate and attend to the same. The cranes on which the Lanterns are placed, are also rigged so as to be readily turned horizontally from one position to another, so as to present one or both lights to the view of observers when laying athwart ships at the time of signalling.

On the Use and Application of the Improvement for Night Signals.

When the vessel is under weigh, or going ahead in its course, the Lanterns are to be placed directly athwart ships, so that such colored light therein will then have the position and place prescribed by Rule Seventh of the aforesaid Supervising Inspectors of Steam Boats, and with the screens behind them, as above described, will then answer all the intents and purposes for which the colored lights are thus required to be used, as illustrated in the several diagrams published by said Inspectors for the working of a system of Colored Lights. The Lights in this case, according to the color seen by the observer, indicate the course or direction of the vessel whereon they are carried. When the Lanterns with the colored lights therein, are made to revolve around on their axis, as proposed in this improvement, in addition to the signal above, another, and as we believe, very important and useful signal is thus formed, indicating that the vessel, whereon it is carried, is a Steamer. In dark foggy nights, it is found by experience, to be somewhat of a difficult task to distinguish sailing vessels from Steamers and Propellers, especially when the latter are rigged, and carry a press of sail. When Steamers meet "head and head," it is the duty of each to pass to the right, or, on the larboard side of the other. Whereas, when a Steamer meets a sailing vessel, the former must give way and allow the latter to pursue its course. Hence, to carry out the regulations of the said Steamboat Inspectors, and prevent collisions, it is important to have some infallible sign, whereby the character of the vessel may be readily seen and determined. Several very fatal collisions have recently taken place through mistakes of this kind.

On Signals for Speed and Distance.

The gearing of the Lanterns with the paddle wheel or propeller shaft, may be so arranged as to be an index of their speed. A very good proportion, would probably be to make the Laterns turn about one-third as fast as said shaft. Hence, when the speed of the vessel is previously known, when making a certain number of revolutions of the paddle or propeller, it becomes an easy task from observing the time with which the Lanterns thereon may be turning to approximate to the speed with which the said vessel is moving at the time of observation. Again, as the arcs described by the rays of light from each lantern, as they revolve around on their axis, is greater in proportion to the distance from said lantern, so will the time in which said rays move over any given space, be less in the same proportion. Hence, when the lights are very remote, or far off, from the observer, the duration of each column or cylinder, of rays from each lense, would pass the eye of the observer, in a short space of time, or with great velocity. Whereas, at a nearer point of observation, the time of its passage would be considerably lengthened, or the motion thereof apparently much slower. From these facts, we believe the improvement is susceptible of indicating, in an approximate manner, the speed and distance of vessels whereon the revolving lights may be used.

On the Application of the Improvement for Marine Telegraphic Purposes.

The Revolving Lights can be readily applied to the general purposes of Marine Signalling at night, as follows: In order to show this application, we have adopted the Numbers as given in Roger's Code of Marine Day Signals, believing that work to be somewhat of a standard in matters of this kind. Instead of the flags used in the above code, for day signals, to indicate the combinations of two or more letters of the Alphabet, which combination is referable to certain numbers indicative of the words or sentences telegraphed, we propose to perform the same operation, at night, by means of the two revolving colored lights, so as to indicate the numbers directly to which the intended words or sentences to be telegraphed are referable. Thus, whether the vessel to be signalled is ahead, astern, or abaft the beam, the position of the two colored lights must be so adjusted, by means of the moveable cranes, whereon said lanterns or lights are fixed, that the two lights may be fully made visible to the observer. When both lights are thrown into this position, stopping the motion of the lanterns may be the signal for calling attention, or a rocket fired off, or the steam whistle blown, would answer the same purpose. Now, in order to represent the ten numerals, we propose to indicate them by the respective motions of the two colored lights, as follows:

RED LIGHT.				GREEN LIGHT.			
One Red,	Represents	Number	1.	Two Green,	Represents	Number	2.
Three	do.	do.	3.	Four	do.	do.	4.
Five	do.	do.	5.	Six	do.	do	.
Seven	do.	do.	7.	Eight	do.	do.	8.
Nine	do.	do.	9.	One	do.	do.	0.

In the above arrangement, it will be seen that all the odd numbers are made by the Red Light, and the even numbers by the Green Light. In order to indicate the repeat of the last number, once or more times, or for other special purposes, which may hereafter be found useful and necessary, an even number of lights may be shown by the Red, and an odd number by the Green. It will be understood that when the Lanterns are made with three lenses in them, the numerals as above arranged are formed by the number of times a new light or lense is presented to the observer. Thus to indicate the number 3, the Red Light or Lantern would make one entire revolution; and to make the number 6, the Lantern carrying the Green Light would make two revolutions, and so on with the other numbers. When a symbol is made, the motion of the Lantern is to be suspended for a short time, and when a number expressing a sentence is formed, the lantern may be stopped for a longer period, or some one of the special signals above referred to, may be used for this purpose.

To show the application of this improvement as above mentioned, whereby these Lights can be used as readily for Night Signals, as Flags are used for Day Signals by the author of Roger's Code, we shall use the sign O, colored red or green, according to the light used, to show the number of movements performed by the respective lights in order to represent any desired number of said code, suitable for the required purpose.

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O,	
O, O, O, O, O, O, O.	
	O, O.
	O, O.

The above would represent the number 5722, and by reference to said Roger's Code, would be found to stand before the sentence:

"WILL YOU SHOW THE NUMBER THAT REPRESENTS YOUR NAME?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O.	
O, O, O, O, O, O, O.	
	O, O.

Here the number expressed is 1572, and per the same Code, stands for

"WHERE ARE YOU BOUND?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O, O, O, O, O.	
	O, O.
	O, O, O, O, O, O, O, O.

The number thus expressed is 1928, and per said Code is

"WHAT IS YOUR CARGO?"

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O.	
	O, O, O, O, O, O.
	O.
O, O, O.	

Here the number expressed is 5603, and stands for

"HAVE YOU ANY NEWS?"

(RED LIGHT.) (GREEN LIGHT.)

Fig. 2

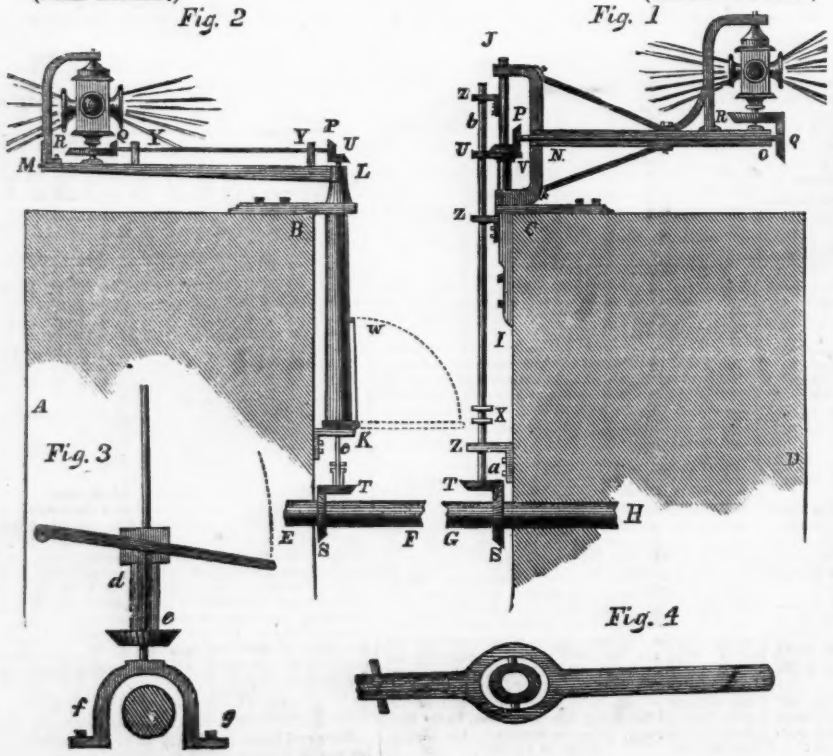

Fig. 1

Fig. 3

Fig. 4

MECHANICAL CONSTRUCTION.

In our engravings, Figs. 1 and 2, represent Vertical Sections through the wheel-house. In them E F and G H represent portions of the main Shaft. In Fig. 1, I J is a stout Iron or Wooden post, fastened against the side of the wheel-house, directly over the main shaft. On the upper part of this post, is fitted the moveable arm or crane N O, to the main shaft is fitted the bevel wheel S, and to the lower end of the rod a b, is fitted a corresponding wheel T. U is a small pinion on a b, which gears with the spur wheel, V, which in turns gives motion to the wheels, P and Q, and so revolves the lamp R. It will be seen that a Rotary motion is given to the lamp, when the main shaft is in motion and a b connected.

It can be disconnected by a lever, acting between the bosses X, which will elevate the rod in the guides Z Z Z.

Fig. 2 is another arrangement, for the same purpose. In this, K L, represent a hollow Shaft, on which is firmly fastened, the arm L M, on which is the lantern. The hollow post is secured to the wheel-house by the straps K and B, and it can turn freely in them, the other part being the same in them as in fig. 1

The lever K W, when drawn down, will turn the frame in any required position around the, Shaft c U. In fig. 1, the arm or crane N O, may be operated by cords from the wheel-house, but in this device, the rod c U, does not lift up as in fig. 1, but in its place, the lower end is made square, and on it slides the short tube, d E, shown in fig. 3. The lower end of the rod turns on a bridge, f g, spanning the main shaft. On the upper end of the tube, d e, a lever is attached by means of boxes and collars as shown in fig. 4. This lever when raised carries with it the beveled wheel T, thus disconnecting the gearing apparatus.

ALBERT POTTS, Patentee,
PHILADELPHIA, Pa.